

# SOCIOOMETRY

A JOURNAL OF RESEARCH IN SOCIAL PSYCHOLOGY

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VOLUME XIX • NUMBER 4 • DECEMBER 1956

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# SOCIOOMETRY

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*Sociometry* is concerned with the entire range of interests and problems represented by research in social psychology. It is the policy of the editors to seek those manuscripts for publication which represent the significant research interests of investigators who are concerned with giving the field of social psychology theoretical structure and reporting research which is clearly focused, well designed, and competently conducted.

While social psychology is presently regarded by most as a field with indeterminate boundaries, it has as its central focus the investigation of the processes and products of social interaction at the interpersonal, intra-personal, intergroup and intragroup levels and the development of significant generalizations therefrom. In keeping with the more general meaning of the name of the journal emphasis will be placed on measurement of social behavior. However, this emphasis does not exclude the acceptability of good articles which must rely upon qualitative materials and analyses.

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## An Experimental Investigation of Negative and Positive Relations between Small Groups through Judgmental Indices<sup>1</sup>

O. J. HARVEY, *Vanderbilt University*

The aim of this study is to explore the use of judgmental indices as precise indicators of negative and positive attitudes between small informal groups. The major focus will be on the effect of these intergroup attitudes on the judgments of performance of in-group and out-group members.

This approach represents an extension to the area of intergroup relations of the technique of investigating motivational factors through their influence on the "cognitive" processes. Among the host of studies demonstrating the general validity of this method, the most directly relevant evidence is provided by a series of experiments showing that interpersonal and intragroup relations may be assessed accurately through judgments of performance on a task of sufficient relevance and ambiguity. Thus married couples and sweethearts overestimated each other's future performance significantly more than did pairs of mutually unfriendly individuals (5, 6). And in small informal groups, the discrepancy between an individual's performance and judgments of it by other group members was significantly correlated with the status hierarchy prevailing in each group (4, 9). This correlation seems to be higher for groups of greater solidarity. Heightened group solidarity, which may be generated by interaction with an antagonistic out-group (8, 10, 11), appears correspondingly to be accompanied by a greater tendency toward maximizing the performance of in-group members, even to the point of consistent overestimation.

### HYPOTHESES

In line with the above considerations, judgments were obtained under three conditions: (a) when a group functioned apart from any other group (*intragroup* situation), (b) when a group functioned in the presence of an unfriendly out-group (*negative intergroup* situation), and (c) when a group functioned in the presence of a friendly out-group (*positive intergroup* situation). The hypotheses are formulated in accordance with these operations.

<sup>1</sup> This experiment was carried out as a unit in the University of Oklahoma Inter-group Relations Project under the direction of Dr. Muzafer Sherif. At that time the project was supported by a grant from the Rockefeller Foundation. A more complete report is on file in the library of the University of Oklahoma in the author's doctoral dissertation of the same title (1954).

1. The first hypotheses pertain to heightened solidarity during interaction with an antagonistic out-group. They are based on the experimental finding that the discrepancy between actual performance by a group member and judgments of his performance by fellow members is correlated with group status, viz., that the higher the status of the group member, the greater the tendency of his fellow members to overestimate his performance.

1a. When the task is performed in the presence of an antagonistic group, the positive correlation between status and the discrepancy between actual and judged performance will be significantly greater than in the intragroup situation.

1b. When the task is performed in the presence of a friendly group, the correlation between status and discrepancy between actual and judged performance will not differ significantly from that in the intragroup situation.

2. The next hypotheses also pertain to the experience of heightened solidarity during interaction with an antagonistic out-group. They are based on the observation that in-group members tend to maximize the achievements of their fellows in the face of antagonistic or rival groups.

2a. When the task is performed in the presence of an antagonistic group, the discrepancy between actual performance and judgments by fellow members will reveal a significantly greater tendency to overestimate than in the intragroup situation.

2b. When the task is performed in the presence of a friendly group, the discrepancy between actual performance and judgments by fellow members will not differ significantly from that in the intragroup situation.

3. Another observation that has been noted is that group members tend to deprecate the achievements of a rival or antagonistic out-group. The following predictions were accordingly made:

3a. When group members judge the performance of an antagonistic group, they will underestimate the performance of members of that group.

3b. When group members judge the performance of a friendly group, the discrepancy between judgment and performance will not differ significantly from the discrepancy between judgment and performance of fellow group members.

That the relationship between groups is mirrored in the characteristics attributed to out-groups (stereotypes) seems fairly well established (1, 8). In the present study stereotype ratings were made of in-group and out-group members. Since the selection of the experimental groups depended to a great extent upon the response of the subjects to a sociometric questionnaire, it would be surprising indeed were not more positive characteristics attributed to in-group and friendly out-group members than

to members of an antagonistic out-group. Therefore, no formal hypotheses will be advanced concerning the stereotype ratings of this study. This information will be used as a validity check for the judgmental indices to be obtained.

#### SUBJECTS

Altogether, 74 experimental subjects participated in the study: 4 pairs of cliques with reciprocally friendly relations (34 subjects) and 4 pairs of cliques between which antagonistic relations existed (40 subjects). All subjects were females between seventeen and twenty-one years of age who were either enrolled in college or undergraduate nursing schools. All subjects were tested in the dormitories in which they lived.

The experimental groups were clearly defined cliques ascertained by two independent measures: sociometric choices and ratings by house counselors who knew the cliques well enough to evaluate the relations between them and to rate their members in terms of relative status within the group. Criterion questions were formulated so that a measure of relative influence on initiation and direction of group activities rather than of popularity per se would be obtained. Sociometric choices were weighted by 5, 4, 3, 2, 1 for first, second, third, fourth, fifth, and below choices respectively. The total of the weighted choices received by an individual was taken as his relative standing within the group.

Only those groups were used in the experiment which were shown by both sociometric choices and ratings of counselors to possess well delineated status positions within the group and clear-cut relations between the groups. Not all members of the 16 experimental cliques served as subjects. Only individuals occupying positions which were shown by the two measures of status to stand at clearly differentiated levels in the group hierarchy were used as subjects. The number of subjects in each experimental clique varied from three to six, the modal number being four. For the 16 experimental groups, an average rank order correlation of .81 existed between sociometric choices and counselors' ratings.

So that the subjects would not suspect that they had been selected to participate in the experiment because of their group membership, all sociometric questionnaires were administered by a counselor who explained that the results were sought for better counseling service in the respective houses.

#### EXPERIMENTAL TASK AND APPARATUS

The experimental task and apparatus were chosen only because they satisfied two basic prerequisites, namely, that the task be meaningful to the subjects and that it be sufficiently unstructured to permit the atti-

tudes under investigation to influence response. The most crucial aspect of the experimental task was the judgment of the number of city names which each subject wrote while listening to a 4-minute tape recording that described a fictitious island. An opaque projector was used to project the names of cities that each subject wrote. Judgments of each performance were made by all subjects present. The names of the cities were written with an IBM pencil within an enclosed writing area of 6 by 6 inches. The use of IBM pencils was to ensure uniform darkness of all projected items. The writing space was enclosed to reduce cues like those which would come from having learned approximately how many words can be written on a page of a certain size, and to help hold constant the form or patterning of writing, which pretesting had shown influenced judgments.

The stereotype rating scale, on which in-group and out-group members were rated, was in graphic form, containing 10 such characteristics as friendliness, snobbishness, morality, and cooperativeness.

#### PROCEDURE

In order to obtain a comparative index of the influence of interaction with out-groups on solidarity of in-groups, each group participated in two experimental sessions. The first session constituted the *intragroup* and the second the *intergroup* (negative or positive) situation. In the intragroup situation, selected members of a particular in-group served as subjects without contact with the out-group. In the second, or intergroup situation, members of two cliques with either negative or positive intergroup relations were brought together in the experimental situation where they interacted in a face-to-face way.

The procedure for the two sessions was virtually the same. In the intergroup situation the performance of *both* in-group and out-group members was judged and ratings were made on the personal characteristics of each member of both groups.

The specific procedure is summarized in the instructions:

This experiment is a study in testing span of attention, that is, how well you can concentrate on more than one thing at a time. The way we will test this is that I will play a recording, and while you are listening to it, write down the names of all the cities and towns you can think of. You will be tested on your comprehension of the contents of the recording, so your real score will depend as much on your comprehension of the recording as on the number of items you write. Begin to write as soon as you hear the first word of the recording. I will tell you when to stop.

Subjects were instructed they would be tested on the contents of the recording so that the announced purpose of the study would seem plausible and its real purpose concealed. Also the attempt to comprehend the

recording interfered with the task of writing city names, reducing the possibility that the number written would be so great that only wild guesses could be made.

At the end of the 4-minute recording, the papers on which the names of the cities had been written were collected before individuals had time to count or compare. Then the performance of each subject was projected on a screen for 2 seconds by the opaque projector. Each subject recorded the number of items she judged to have been written by the particular individual whose performance was being projected. Following judgments of performance of in-group and out-group members, subjects were tested on the contents of the recording, for the reasons mentioned above. As the last step, in-group and out-group members were rated on the stereotype scale described earlier.

#### RESULTS AND DISCUSSION

In Table 1 are presented results which confirm hypotheses 1a and 1b. The average rank order correlation (2, 3) between an individual's status and the discrepancy between her actual performance and judgments of it by other group members was significant for all groups. This correlation did not change significantly from the interaction of friendly groups, but it did increase significantly when the task was performed in the presence of an unfriendly out-group.

It may be noted that in the intragroup session, the correlation between status and judgment of performance in "positive" groups is .13 higher

TABLE 1

*Average Rank-Order Correlation of Status and Discrepancy between Judged and Actual Performance of In-group Members in Intra- and Intergroup Situations*

Intergroup relationship	Intragroup session		Intergroup session		Intragroup-intergroup	
	rho	P	rho	P	Diff.	P
Positive	.79	< .01	.75	< .01	-.04	> .80
Negative	.66	< .01	.88	< .01	.22	< .01

TABLE 2

*Median Discrepancy between Judged and Actual Performance of In-group Members in Intra- and Intergroup Situations*

Positively related groups					Negatively related groups				
Intra-group	Inter-group	Diff.	T	P	Intra-group	Inter-group	Diff.	T	P
.62	-.12	-.74	17	> .05	-2.69	1.68	4.37	0	< .01

than that for "negative" groups in the intragroup session ( $P = .02$ ). In the intergroup session this difference in correlation of .13 is reversed. These differences, with those in the tendency toward over- or underestimation of performance shown in Table 2, suggest that the groups which were positively related toward out-groups were *in these cases* also characterized by more positive intragroup relations than were the groups that were antagonistically related to out-groups. However, in the intergroup session the negatively related groups closed ranks, as it were, significantly more than did members of positively related groups.

The results presented in Table 2 confirm hypotheses 2a and 2b. As determined by the method of paired replicates (12), no significant changes occurred in the magnitude of discrepancy between judgments of performance and actual achievements of in-group members as a result of interaction with a friendly out-group. But there was a significantly greater tendency to overestimate performance of in-group members when negatively related out-groups interacted. Members of these latter groups tended to underestimate the performance of fellow members in the intragroup session but to overestimate it when interacting with an unfriendly out-group. A slight but not significant tendency in the reverse direction occurred among the positively related groups.

The results of Table 1 and Table 2 are interpreted as indicating that interaction with antagonistic out-groups was accompanied by increased solidarity within the group, while interaction between friendly groups had no significant effects.

The preceding results were based on comparisons of judgments made by in-group members of each other's performance in intra- and intergroup situations. The next comparisons, relevant to hypotheses 3a and 3b, are between groups, i.e., between judgments of performance of fellow in-group members and judgments by the same individuals of the performance of out-group members (Table 3). These comparisons, based on paired replicates (12), show that performance of friendly out-group members was judged as favorably as that of in-group members. In contrast, when intergroup relations were antagonistic, the accomplishments of in-group members were overestimated and the achievements of out-group members were grossly underestimated. Hypotheses 3a and 3b are thus confirmed.

TABLE 3  
*Median Discrepancy between Judged and Actual Performance of In-group and Out-group Members*

Positively related groups					Negatively related groups				
In-group	Out-group	Diff.	T	P	In-group	Out-group	Diff.	T	P
-.12	.31	-.44	17	>.05	1.68	-4.88	6.56	0	<.01

The change in judgmental indices accompanying interaction with antagonistic out-groups is interpreted as reflecting resulting increases in group solidarity. Although two previous studies have suggested it (4, 9), there has yet been no irrefutable demonstration that judgments of performance validly reveal group solidarity. Most desirable, therefore, would be the establishment of the relationship of such judgmental indices to independent criteria of solidarity. In the present study this goal has not been ideally met. However, information from the other two instruments employed, sociometric questionnaire and stereotype rating scale, should provide some measure of a validity check for the judgmental indices.

If we might assume that heightened group solidarity and *esprit de corps* parallels the tendency to attribute more favorable characteristics to group members and to limit more the sociometric choices to own group members, then the correlation between our judgmental indices and these latter measures should provide an indicator of some reliability of the extent to which judgments of performance may yield an index of group solidarity.

Two such comparisons are possible from the design of this experiment: (a) percentage of in-group choices on the sociometric questionnaire (i.e., of the total number of choices made by the experimental subjects, the percentage of these preferences for their own group within the house as a whole) and judgmental indices relating to the performance of in-group members in intragroup situation, and (b) percentage of favorable ratings made of in-group members on the personal characteristics scale compared to judgmental indices based on performance of in-group members in the intergroup situation. Unfortunately data were not collected which would permit a comparison of judgmental indices in the intra- and intergroup situations with the same outside measures of solidarity for both situations.

In making the first comparison, the 16 experimental groups were first ranked in terms of percentage of in-group choices on the sociometric questionnaire. The upper and lower halves were then compared, by Wilcoxon's method of unpaired replicates, for differences in the two judgmental indices: (a) correlation between an individual's status in the group and the tendency toward overestimation of his performance by other group members ( $T = 32$ ,  $P = <.01$ ), and (b) the median magnitude of discrepancy between performance and judgments of performance by other in-group members ( $T = 39$ ,  $P = <.01$ ).

The second comparison, of the two judgmental indices (a and b above) and ratings on the personal characteristics scale, was made in the same way. The difference between the upper and lower halves of the ranked stereotype ratings for each of the judgmental indices was significant ( $T = 29$ ,  $P = <.01$ ; and  $T = 37$ ,  $P = <.01$  for indices a and b above, respectively).

Thus if the sociometric and stereotype ratings obtained in this study

reflect group solidarity, then it seems warranted to assume the judgmental indices may also be reflective of this group factor.

In line with our assumption, the stereotype ratings made of in-group members and friendly out-group members were preponderantly favorable while the evaluations made of members of antagonistic out-groups were predominantly negative.

#### SUMMARY AND CONCLUSIONS

This study was an experimental investigation of negative and positive relations between small informal groups (cliques) existing in everyday life. The problem was approached through ascertaining the differential effects of these relationships upon judgments of group members.

Sixteen small groups with well-defined status positions and with clear-cut negative or positive intergroup relations, as shown by sociometry and observers' ratings, participated in the experiment. These 16 groups, containing 74 individuals, represented 4 pairs of friendly and 4 pairs of antagonistic groups. Each group participated in the first, or *intragroup*, session without contact with the out-group. In the second, or *intergroup*, session pairs of groups which were reciprocally friendly or unfriendly were brought together in the experimental situation. In the intragroup session, subjects judged the performance of in-group members on an experimental task. In the intergroup session, judgments were made of the performance and personal characteristics of both in-group and out-group members.

In line with the hypotheses, it was found:

1. The positive correlation between in-group status and the discrepancy between judged and actual performance in the intragroup situation increased significantly in the intergroup situation when the relations between the interacting groups were negative, but this index did not change significantly from the intragroup situation when the relations between interacting groups were positive.
2. When group members performed in the presence of an antagonistic group, they overestimated each others' performance significantly more than when they were not interacting with the other group. However, discrepancies between estimation and performance in intragroup and intergroup situations did not differ significantly when the interacting groups were friendly.
3. There was a significant difference between estimations of performance of fellow group members and estimations of performance of unfriendly out-group members. While the performance of fellow members was overestimated, the performance of members of unfriendly out-groups was greatly underestimated. No significant difference was found when the groups were friendly.

These results were interpreted as indicating that increased solidarity of in-groups accompanied interaction with antagonistically related out-groups. Further support was obtained for the notion that the nature of the stereotypes held of out-groups and their members is in line with the particular relationship prevailing between the groups. The feasibility of obtaining experimental indices of intergroup relations through their differential effects on perceptions and judgments of group members seems to be demonstrated by these results. On topics eliciting resistance to candid expression of opinion, it is believed that such an indirect method of attitude assessment as is possible through perceptual and judgmental indices may prove to have greater validity than some of the more direct techniques.

*Manuscript received: January 23, 1956*

*Revised manuscript received: June 22, 1956*

*Revised manuscript received: July 19, 1956*

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## **Personality and Group Position<sup>1</sup>**

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Sociological and psychological theorizing have found a common meeting-ground in small group research. Laboratory investigations of social influence provide a fuller understanding of many social processes. Considerations of role and social system add to our knowledge of personality functioning (e.g., 3, 4), and the interaction of personality and social system in determining a given individual's behavior frequently can be demonstrated best in laboratory experimentation. The present paper describes an exploratory investigation of this interaction of personality and social systems and also illustrates a procedure through which additional research may be carried out under relatively controlled conditions.

Individuals with widely divergent personality characteristics frequently are assigned to common positions in on-going social structures. The usual outcome is that the initially different people are observed to behave in a strikingly similar fashion. Thus, McClelland writes, "The ability of people to transform themselves at least partly in accordance with the demands of a situation has long been observed by students of human nature and has an honorable place among the concepts used by social scientists" (3, p. 290). This similarity in position behavior frequently results from individual conformity to relatively similar role expectations. However, role expectations, no matter how strong, will not evoke a given response pattern if the individual assigned to the position does not have this pattern in his response repertoire.

The concept of "response hierarchy" appears to be useful here. Faced with similar group positions and, hence, similar situational requirements, individuals of different personality types will initially respond in a somewhat different fashion to the extent that the required response is located differently in the individuals' response hierarchies. In other words, the required response will probably occur sooner the higher the response in the hierarchy. However, assuming that this required response is in the individual's repertoire and that there are no response inhibiting factors, it is likely that the required response eventually will occur. Over time, then, the individuals of different personality types will come to behave in a similar fashion.

The present exploratory investigation will attempt to demonstrate this

<sup>1</sup> Thanks are due to Mrs. Marsel Heisel for her invaluable assistance in the collection and analyses of data, and to Dr. J. C. Gilchrist for his suggestions concerning the statistical analysis.

change over time employing individuals markedly different in their characteristic level of ascendancy. Four-man groups are utilized with one central position (a position that communicates directly with each member of the group) and three peripheral positions (who can communicate only with the central person). Individuals high or low in their characteristic level of ascendancy are assigned either to a central or peripheral group position. The high ascendancy subjects (Ss) in the central position, with its requirements for generally ascendant behavior, initially should behave differently from the low ascendancy Ss. Ascendant responses are higher in the response hierarchies of the former. However, the low ascendancy Ss then should gradually adapt to the position requirements so that by the last of the three trials given to the groups the high and low ascendant Ss should be similar behaviorally. Furthermore, to the extent that the central position does require ascendant behavior, the low ascendancy central Ss should have the greatest change from Trial 1 to Trial 3 and they should change in the direction of the behavior exhibited by the high ascendancy central Ss.

In addition, the present study will seek to determine whether the previously obtained relationship between low job satisfaction and the occupation of peripheral positions (e.g., 2, 5) is similar for both the high and low ascendancy Ss. High ascendancy peripheral Ss may feel that their peripheral position imposes severe restrictions upon their communication opportunities and thus does not enable them to play so prominent a role in the group as they would wish. Low ascendancy peripheral Ss, on the other hand, presumably do not have so strong a need to play a prominent role in the group and should be bothered less by the imposed communication restrictions. As a result we would expect the high ascendancy Ss to be less satisfied with their positions than the low ascendancy Ss.

#### METHOD

##### *Selection of Subjects*

Volunteers were recruited from introductory psychology classes and all completed the Guilford-Zimmerman Temperament Survey. Those scoring in either the upper or lower third of the range on the G-Z Ascendance scale (men and women were kept separate) were scheduled for further "screening." Groups of four men or four women were assembled consisting of two high ascendancy and two low ascendancy Ss. (Occasionally, however, one of the scheduled Ss did not keep his appointment and a three-person group had to be used.) Each group was given the task of assembling the framework of a small house, approximately 6 feet high and with a 4-foot-square base, from precut pieces of lumber, while two observers categorized the ongoing behavior. After 30 minutes—very few of the groups completed the task in this time—work was stopped and the Ss answered a brief socio-

metric questionnaire. The observers also rated each S on a number of scales.

An S was classified as being characteristically highly ascendant if he met the following criteria: (a) he had a G-Z Ascendance scale score in the upper third of the range for his sex, (b) both observers had rated him either highest or next highest in the observed group on their "attempted leadership" scale, (c) he had received the highest or next highest total ratings from the others in his group on the Subject Scale, "How frequently did each member attempt to influence your behavior?", and (d) he had the highest or next highest total amount of recorded participations (summed over both observers) in the given group. An S was classified as being characteristically low in ascendancy if he had a G-Z Ascendance score in the lowest third of the range for his sex and a rank of 3 or 4 in his group on each of the remaining three measures. For the three-person groups the required ranks were 1 and 3 respectively.

#### *The Experimental Session*

The above screening process, together with the failure of some Ss to keep their appointments, resulted in the selection of 21 highly ascendant and 21 low ascendant Ss (10 men and 11 women in each category) out of the original pool of approximately two hundred volunteers. These Ss were employed in the major experimental session together with moderately ascendant Ss, Ss whose G-Z Ascendance scores had fallen in the middle third of the range. Four-person groups were assembled from this reduced pool, consisting of one highly ascendant, one less ascendant, and two moderately ascendant Ss. None of the Ss in a group had worked together previously.

The present group task was adapted from that employed by Shaw (5). The apparatus consisted of a room partitioned into four cubicles radiating from a central point. Each cubicle was connected to every other cubicle by means of a slot through which message cards could be passed but which did not permit the Ss to see each other. Each cubicle was identified by a color: blue, red, green, or yellow. The message cards sent by a given position identified the sending position by its color and the designations were the color names.

The present communication network was a "star" pattern. Blue was the central person who could communicate directly to each of the other three positions. These other three positions were peripheral. Their communication slots were arranged so that the only communication possible for each was with Blue.

Each S maintained his position in the network over the three problem-solving trials given to his group. The first trial was stopped at the end of 20 minutes if the problem had not been completed by that time, while

the time limit for each of the remaining two problems was 16 minutes. The problems were administered to the groups in a systematically rotated order. The following is an example of the type of problem used:

A small company is moving from one office building to another. It must move four kinds of equipment: (1) chairs, (2) desks, (3) filing cabinets, and (4) typewriters. How many trucks are needed to make the move in one trip?

Each S was given two of the eight necessary items of information, and the items supplied to a given position were also continually changed from one group to the next.

#### *Procedure*

In half of the groups (Hi Ascend.-Center) a highly ascendant S was assigned to the central position, Blue, the low ascendance S to the peripheral position, Green, and the moderately ascendant Ss to the other peripheral positions, Red and Yellow. In the other groups (Low Ascend.-Center) the low ascendance person occupied the central position, while the high ascendance S occupied position Green<sup>2</sup>. The moderately ascendant Ss in this condition again were assigned to positions Red and Yellow.

After each S had been seated the E explained the task and then started the group on the first trial. An S would signal when he had obtained an answer satisfactory to him by raising his hand and the E noted the time at which each S gave this signal. These data are employed in the analyses of time to problem completion. When each S in the group indicated he had an answer or at the end of the time limit, whichever came first, the E collected the problem and information cards and the message cards received, distributed the problem and information for the new trial, and then started the group upon the new trial. When all three problems had been completed, the Ss filled out a brief sociometric questionnaire.

Every male group had at least one member reach an answer to the first problem that was satisfactory to him by the time limit. However, half of the female groups did not solve the first problem within this period. Because of this difference the data from the male and female groups were not combined, and the present analysis is restricted to the 10 male groups of 4 Ss each.

<sup>2</sup> This design does not enable us to differentiate the "main effects" (in the analysis of variance sense) due to a given personality type's behavior over both the central and peripheral positions from the "interaction" of personality and position and from the effects upon a given personality type of the other type in the other position. The small number of Ss remaining after the screening process did not enable us to utilize a more satisfactory design. This small number of Ss, of course, also severely restricts the generality of the present findings. However, despite the inadequacies of the design, we believe the results are suggestive and that the present interpretations are entirely consistent with everyday observations.

## RESULTS

*Time to problem solution*

Table 1 presents the mean time to problem completion (in 10-second intervals) for each position in the different trials and conditions. Analyses of variance indicate that the significant differences were (all beyond the .01 level) among groups within a condition, among Ss within groups within conditions, and among groups within conditions and trials. However, the second order interaction of positions, conditions, and trials was still significant with the residual employed as the error term ( $F = 9.08$ ,  $P = .001$ ). Also, as can be readily seen in the table, there were significant differences among trials ( $F = 92.89$ ,  $P < .001$ ), with the time to solution decreasing from the first to third trials indicating a group "learning" effect.

A Duncan test (1) then was made to determine the significant differences involved in the second order interaction\*. Trial I was significantly longer than the other trials for all the positions within both conditions. What is most striking in the first trial data is that Blue (the central position) in the High Ascend.-Center condition had a significantly shorter time to problem completion than all other positions in this condition, while Blue in the Low Ascend.-Center condition tended to have a longer time to problem solution than the peripheral positions in this condition. In this Low Ascend.-Center condition, however, only Green—the peripheral position occupied by the highly ascendant S—had a significantly shorter time to problem solution than the central person. Green, in turn, was significantly faster on trial I than both Yellow and Blue in this condition, but not significantly faster than Red, although this last difference approached significance. There were no significant differences in the second and third trial data.

The highly ascendant Ss, whether in the center or periphery, perhaps because of a high degree of self-confidence, tended to complete their first problem and feel satisfied with their answers before the other group members. The low ascendance individuals in the central position, on the other hand, tended to have taken the longest of all the positions in this condition to indicate that they had reached a satisfactory solution to the first problem, perhaps because they were low in self-confidence. These Ss apparently first supplied their other group members with the relevant information they had received before deciding on a problem answer. They seem to have given information transmission a higher priority than their own problem solution. The high ascendance Ss in the center, on the other hand,

\* Unless otherwise specified, all differences found to be statistically significant by means of the Duncan test are significant at the .05 level or less.

TABLE 1  
*Mean Time to Problem Completion (in 10 second Intervals)*

Condition .....	High ascend.-center				Low ascend.-center			
	Blue	Green	Red	Yellow	Blue	Green	Red	Yellow
Position .....	High	Low	Mod.	Mod.	Low	High	Mod.	Mod.
Type .....	High	Low	Mod.	Mod.	Low	High	Mod.	Mod.
Trial I	70.8	93.8	97.2	98.0	88.4	71.2	80.8	84.8
Trial II	45.0	49.0	49.4	51.8	34.8	33.8	39.0	39.0
Trial III	38.4	33.4	44.2	39.2	37.4	35.0	38.0	37.0

may have minimized or at least delayed the information transmission aspect of their job in favor of their own problem solution.

These differences became minimal in the second and third trials. Two reasons may be advanced for this. First, the group members seem to have learned to use the communication network and time to solution was cut in half. As a result, the problem situation may have become easy enough for even the low ascendance Ss. With longer and more difficult problems the differences might have persisted. Second, each group member, regardless of personality, may have adapted to his position requirements sufficiently so that the first trial differences would not have emerged with even somewhat more difficult problems. According to this latter hypothesis, the low ascendance Ss in the center had learned to play a more active role in the group process than merely transmitting information, while the ascendant peripheral Ss had learned to take a less active role.

#### *Communication Content*

A rough check of this last possibility can be found in the analysis of the messages transmitted by each position. Because of the small frequencies involved, it was possible to utilize only two categories: (a) the transmission of any information in the particular message card, and (b) the transmission of any other communication (e.g., asking for information, proposing a solution to the problem, etc.). Information-seeking constituted the largest proportion of this second category. One message card could contain both categories, but only one of each category could be coded for each card. The two observers agreed on the categorization of 88 per cent of the messages sent by each position over the three trials for two randomly selected groups.

The frequencies in each category first were tabulated, and for each S we ascertained the proportion of all units transmitted by him which were informational. We assume here that the greater the proportion of informational units the more passive the role played by the S. The nature of the present task is such that each position has to transmit information. The

TABLE 2  
*Per Cent of Units Which Were Informational Transmitted by Position (Arc Sine Transformation)*

Condition . . . . .	High ascend.-center		Low ascend.-center	
	Blue	Green	Blue	Green
Position . . . . .	High	Low	Low	High
Type . . . . .				
Trial I	45.4	62.0	51.6	35.0
Trial II	48.4	50.4	48.0	55.4
Trial III	47.2	65.0	36.8	55.2

individual demonstrates a more active role in the group process by communicating other kinds of content. These percentages then were subjected to the arc sine transformation.

The moderate ascendance peripheral positions, Red and Yellow, were not included in the present analysis. The small frequencies in the peripheral positions would mean that a very large part of the data would consist of relatively unreliable percentages if all four positions were to be included. The resulting means for positions Blue and Green are given in Table 2.

Two effects were significant by analysis of variance: positions within groups within conditions ( $F = 8.13$ ,  $P = .001$ ), and the second order interaction of conditions, positions, and trials ( $F = 3.62$ ,  $P = .05$ ). The Duncan test yielded differences consistent with the hypothesis of a change in the roles played by the high and low ascendance Ss in the Low Ascend.-Center condition.

In trial I, as can be seen in Table 2, the low ascendance Ss in the periphery tended to have a greater proportion of informational units than the central high ascendance Ss (significant between the .10 and .05 levels of confidence). The former, then, appear to be playing a more passive role than the latter. This expected difference supports the validity of the present interpretation of a high proportion of informational units. That this difference is probably personality-determined as well as position-determined is suggested by the trial I difference between the low ascendance and high ascendance Ss in this position. The former had a significantly greater proportion of informational units than the latter.

But, most important of all, the hypothesized changes had taken place in the Low Ascend.-Center condition by trial III so that the differences in this condition resemble the differences in the High Ascend.-Center condition. In both conditions during this last trial the central person had a smaller proportion of informational units than the peripheral person. (Both differences are significant between the .10 and .05 levels.) The low ascendance Ss in the center had become somewhat less passive (although

there is no significant difference between trials 1 and 3), while the high ascendance Ss in the periphery had become more passive (difference between trials 1 and 3 significant between the .10 and .05 levels). Both the low ascendance Ss in the center and the high ascendance Ss in the periphery had changed their behavior with increased experience in their positions. Although it is not possible to determine the extent to which the change in one position was responsible for the other position's change, the trial III position behavior, at least for the present communication content, is largely determined by group position rather than personality alone.

#### *Rates of Communication*

The next analysis was to determine whether there were reliable differences in communication rates among the various positions. The number of message cards sent by each S in each trial was tabulated and this frequency was divided by the time taken by the slowest member of the group in that trial (in 10-second intervals). The mean communication rates are given in Table 3.

Analyses of variance of these data indicated that the following were the statistically significant effects (all at less than the .001 level of confidence). As expected, there were significant position differences ( $F = 33.45$ ) over the two conditions with the central positions having the highest communication rates. There also were trial differences ( $F = 38.07$ ). The communication rates increased in both conditions from the first to third trials. The interaction of positions and trials was also significant ( $F = 19.32$ ), as was the second order interaction of conditions, positions, and trials ( $F = 36.33$ ).

The Duncan test points to the differences going to make up these main effects and interactions. First, there were significant increases between trials I and II, and II and III in the communication rates of both the high and low ascendance Ss in the central position. These rates were similar for the high and low ascendance central Ss in the first two trials, but by the third trial the low ascendance Ss in this position had a significantly faster

TABLE 3  
*Mean Number of Messages Sent Per 10-second Interval*

Condition.....	High ascend.-center				Low ascend.-center			
	Blue	Green	Red	Yellow	Blue	Green	Red	Yellow
Position.....	High	Low	Mod.	Mod.	Low	High	Mod.	Mod.
Trial I	11.6	3.8	4.6	7.2	12.4	7.8	5.8	4.8
Trial II	17.2	3.4	5.4	5.4	15.4	10.0	5.8	7.8
Trial III	19.2	4.6	5.2	7.6	23.0	8.8	8.0	5.0

rate than the high ascendance central Ss. The reason for this difference is not clear. Furthermore, except for the high ascendance Ss in the periphery, the communication rates in the peripheral positions tended to remain constant over the three trials. (There was a significant difference between trials I and II for the peripheral high ascendance Ss.) Assuming that the communication rate changes indicate some kind of learning, the learning—with the possible exception of the peripheral high ascendance Ss—was largely an effect of the central position.

Second, consistent differences between the high and low ascendance Ss emerged in the peripheral position with its weaker press of requirements. In each trial, the high ascendance Ss in the peripheral position had significantly faster communication rates than the low ascendance Ss in this position. Furthermore, the low ascendance peripheral Ss tended to have the lowest communication rates of all peripheral positions in their condition, while the high ascendance Ss tend to have the highest rates of communication in the periphery. These differences are constant for all three trials, but the low ascendant peripheral Ss have communication rates significantly lower than only Yellow's rates and only in trials I and II. (The differences with Red just fall short of significance in these trials.) The highly ascendant peripheral Ss in the Low Ascend.-Center condition had communication rates significantly faster than Yellow in all three trials, and significantly faster than Red in trial II. It would appear, then, that the differences in characteristic level of ascendance were most clearly related to differences in communication rate in the peripheral group positions.

#### *Questionnaire Responses*

The questionnaire responses were analyzed in order to determine whether there would be personality differences in the relationship between the position occupied by an individual and his "morale." The first question reads as follows: "How well did you like your job in the group?" The scores ranged from 6 (very much) to 1 (disliked very much). The means for each position in each condition are given in Table 4.

Analyses of variance of these data revealed only one significant effect: that for positions ( $F = 10.25, P = .01$ ). (The number of degrees of freedom was halved in order to compensate for the between conditions heterogeneity of variance.) The Duncan test indicated that both central positions had significantly higher scores than the moderately ascendant peripheral positions, Red and Yellow, but they were not significantly higher than either the low ascendance peripheral position or the high ascendance peripheral position. Also, these latter peripheral positions were higher, but not significantly, than the two moderately ascendant peripheral positions.

TABLE 4  
*Position Means for Questionnaire Responses*

Condition.....	High ascend.-center				Low ascend.-center			
	Blue	Green	Red	Yellow	Blue	Green	Red	Yellow
Position .....	High	Low	Mod.	Mod.	Low	High	Mod.	Mod.
<b>Question 1: "How well did you like your job?"</b>								
Means	6.0	4.4	3.0	2.4	6.0	4.6	3.4	3.8
<b>Question 2: "To what extent did your position in this group permit you to participate as much as you would have wanted to participate?"</b>								
Means	6.0	4.0	3.0	1.4	6.0	4.2	2.2	2.8

If, for the moment at least, we accept the ordering of the positions on their job satisfaction scores as being relatively reliable, the results, at first brush, are partly surprising. We had expected that the high ascendance Ss in the periphery would be very dissatisfied with their jobs because the communication restrictions upon this position would not enable them to become prominent in the group. The moderate satisfaction scores of the low ascendance peripheral Ss was expected; these Ss, it was thought, would not be as disturbed by the communication restrictions because of their lower needs to be prominent. However, the above results suggest that the high ascendance Ss in the periphery were just as satisfied with their jobs as the low ascendance Ss.

There is no reason to believe that these results (or any others) are an artifact of the Green position. Green was not adjacent to Blue's cubicle, and communication from Blue was not easier to Green than to any other peripheral position. A likelier possibility is that both types of Ss in the Green position did not feel that their communication was restricted to any significant extent. The low ascendance Ss would not feel restricted because they presumably would have little need for a high level of participation in the group, while the high ascendance Ss would not let the communication limitations interfere completely with their participation.

The responses to the next questionnaire item were analyzed in order to check this possibility. The item reads, "To what extent did your position in this group permit you to participate as much as you would have wanted to participate?" The scores range from 6 (Permitted me to participate as much as I wanted to) to 1 (Did not at all permit me to participate as much as I desired). The means are given in Table 4.

The analyses of variance, again halving the degrees of freedom because of the heterogeneity of variance, indicates that the only significant effect

was for position ( $F = 6.28$ ),  $P < .01$ ). According to the Duncan test, the two central positions, as expected, had significantly higher scores than all other positions. They could participate as much as they wanted to. Both the high and low ascendance Ss in the periphery had higher scores than the moderately ascendant Ss, but the "highs" felt significantly less restricted than only Red, while the "lows" felt significantly less restricted than only Yellow. Thus, while the present results are not conclusive, they are consistent with the hypothesis that those either characteristically high or characteristically low in ascendance feel less restricted in a peripheral group position than those having a moderate level of ascendance.

#### SUMMARY AND CONCLUSIONS

On the basis of responses to the Guilford-Zimmerman Temperament Survey as well as their observed behavior in a mechanical assembly task, 10 male college students were classified as being characteristically high in ascendance, while another 10 were classified as characteristically low in ascendance. These Ss, together with Ss classified as being moderately ascendant, were assembled into four-man groups consisting of one S low in ascendance, one S high in ascendance, and two who were moderately ascendant. In one condition, High Ascend.-Center, the highly ascendant S was assigned the central position in a "star" communication network while the other three Ss were given the peripheral positions. In the other condition, Low Ascend.-Center, the low ascendance S was given the central position and the remaining Ss the three peripheral positions. Each group had to complete three problems, and measures were obtained for each of the three trials based on time to problem completion, the content of the messages sent by one position to another, and the communication rate. In addition, the Ss filled out a questionnaire indicating their satisfaction with their positions.

One of the areas investigated had to do with the question of differences in the behavior of the high and low ascendance Ss in the central group position. The results suggest that the behavioral differences between the two types of Ss in the central position that did emerge tended to exist only during the first trial. Under the high press of common situational requirements, both the high and low ascendance Ss behaved in a somewhat similar fashion by the third trial. Thus, in the first trial the high ascendance Ss in the center tended to complete their problems before the others in the group, while the low ascendance Ss in this position tended to complete their problems after the others in the group. However, by trial III the differences in the time to problem completion between these two types of Ss in the center tended to become minimal.

These changes have been hypothesized to be a result of a position

adaptation, and there is additional evidence consistent with this interpretation. In the first trial the low ascendancy Ss tended to play a more passive role in the group problem-solving process than the high ascendancy central Ss, as indicated by their somewhat higher (but not significantly so) proportion of information giving units in their communications. They also had a significantly higher level of passivity than the high ascendancy Ss in the peripheral position. However, there was a steady reduction in this level of passivity (i.e., an increase in the proportion of noninformation-giving units) so that by trial III the low ascendancy Ss in the center were significantly more "active" than the high ascendancy Ss in the periphery. This resembles the pattern that had remained consistent in the High Ascend.-Center condition.

These results, then, indicate that for the present central group positions the heavy press of situational requirements for these positions tends, over time, to count more in determining the individual's passivity level and time to problem solution than his characteristic level of ascendancy. To what extent can these results be generalized? On one hand, we would expect that the greater problem complexity and the longer time spent in problem solving found in many "real-life" groups would facilitate the emergence of personality-determined differences in the behavior of the central group members. But, on the other hand, there frequently are traditions and expectations concerning the role behavior of those in the central positions, and it is likely that these would act to minimize the personality-determined differences.

The results tend to support the present theoretical interpretation of the interaction of personality and group positions. The high and low Ss differ primarily in that ascendant responses are higher in the response hierarchies of the former. When confronted with the central position and its requirements for ascendant behavior, these two types of Ss initially behave somewhat differently. The former initially are more likely to behave in an ascendant manner. However, ascendant responses *are* in the response hierarchies of even the low ascendancy Ss and ascendant behavior tends to occur by trial III. Furthermore, the results also indicate that the central position does require ascendant behavior. The low ascendancy Ss change toward the behavior of the high ascendancy Ss.

The present results also suggest that when the behavioral differences between the high and low ascendancy Ss persist over the three trials this is most likely to be the case in the peripheral group positions with their relatively low press of situational requirements. Thus, the high ascendancy peripheral Ss have communication rates significantly faster than that for the low ascendancy peripheral Ss over all three trials. However, there also was evidence of position adaptation changes in the behavior of those in the

peripheral positions, particularly in the case of the high ascendancy peripheral Ss. These Ss became more passive in their communications as they proceeded from trial I to trial III, as indicated by their significant increase in the proportion of information-giving communications. The high ascendancy peripheral Ss resembled the low ascendancy peripheral Ss on this measure of passivity by trial III.

The last set of results has to do with position differences in job satisfaction. As has been found by other investigators, the Ss in the central group position expressed the greatest degree of satisfaction with their jobs. The surprising result was that the high ascendancy peripheral Ss were similar to the low ascendancy peripheral Ss in having somewhat greater job satisfaction than the moderately ascendant peripheral Ss. Further analyses of the questionnaire responses suggest that both the high and low ascendancy peripheral Ss felt less restricted in their communication opportunities than the moderately ascendant peripheral Ss.

*Manuscript received: May 7, 1956*

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## On the Dimensions of Group Behavior<sup>1</sup>

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Social psychology is in a phase of renewed interest in the systematic study of the properties of social groups.<sup>2</sup> It is especially important at this point that investigators take time to clarify the nature of the problem, to identify the more promising lines of attack, and to avoid certain sterile types of effort which have sometimes been made. This paper is oriented to the preliminary task of clarifying and structuring the problem. The position taken here is that it is necessary to further progress in the scientific study of social groups that we achieve a clear and systematic identification of the essential dimensions in terms of which any social interactional field can be described.

When it becomes possible to arrange all social collectivities on a meaningful set of orthogonal (independent) dimensions, the definition of "group" and the discrimination of "group" from "not-group" become arbitrary matters of convenience and not issues of critical debate. As a preliminary to any other objectives, this should save time and energy otherwise wasted searching for the best definition of *a group* by trying to fit alleged groups in some definition. Similarly, this should circumvent the problem of developing valid criteria for determining when a collectivity is a group and when it is not.

Further, a successful outcome of the approach proposed here would provide a basis for a meaningful typology of collectivities or interactional fields which would have wide general utility. In addition to this positive gain, the discipline could be spared fruitless controversy as to the merits and validity of various ad hoc taxonomies. In this connection an incidental gain would be the ease of settling the question as to whether or not laboratory experimental groups are "real" groups. Even modest progress in the direction suggested would ensure that research efforts in comparative study of groups and in relating specifiable characteristics of process and product to specific characteristics of the group would be more likely to yield significant generalizations. Experimentation can certainly be designed and conducted with more clarity and specificity when the significant dimensions

<sup>1</sup> This paper stems from the Social Psychology Project under the direction of Leonard S. Cottrell, Jr., at the Russell Sage Foundation.

<sup>2</sup> The problem of the classification of groups has historically been dealt with in sociology proper. For a review of relevant sociological literature on this topic see (16).

to be controlled and manipulated are identifiable and measurable. It is not too much to expect that a knowledge of the dimensions of natural groups will free and stimulate scientific imagination to hypothesize concerning configurations of dimensions not found in nature and to test such hypotheses experimentally.

Without doubt few investigators would disagree with the importance of the strategy here proposed. Its desirability is implicit in many formulations and explicit in some, but development along these lines as an actuality has generally been placed in the future. For example, in 1941 one of the present authors urged the necessity for the kind of development we are proposing here but his suggestion was not followed up (10). The practical question is, of course, whether the necessary technology and theoretical sophistication are available at this time to implement such a strategy. It is true that studies pointed in this direction are few and for the most part unsatisfactory. Two in particular mark substantial progress in the desired direction of systematization on an empirical basis. We shall discuss them in some detail and, in so doing, indicate some next steps.

In considering studies bearing on our problem it is useful to recall the experience of psychology in attempting description and classifications of personality characteristics. Of particular interest and relevance is the fact that the many descriptive and taxonomic efforts have given way to efforts to identify and measure dimensions in terms of which any personality may be described. This shift was greatly facilitated by the development of factor analytic procedures. Excellent reviews of factor studies of personality have been published by French (11, 12) and Cattell (3, 6, 7). These reviews, while differing in their form and approach, do contain a number of useful lessons and stimulating suggestions for investigators interested in exploring the dimensions of groups. Some of the more salient of these we shall indicate in our following discussion.

The first of the pioneering studies in the dimensions of groups we shall discuss is that by John K. Hemphill and Charles M. Westie, the results of which were published in 1950 under the title "The Measurement of Group Dimensions" (13).

#### *Hemphill and Westie*

The task to which Hemphill and Westie directed themselves was to choose a limited number of variables for systematic group description which were (a) meaningful within a sociological or psychological framework, (b) capable of expression in simple linear measures, (c) molar rather than molecular, and (d) relatively independent (orthogonal). Fourteen characteristics were, on the basis of examination of available descriptive and theoretical materials of others, judged to satisfy the criteria:

1. *Autonomy* is the degree to which a group functions independently of other groups.
2. *Control* is the degree to which a group regulates the behavior of group members.
3. *Flexibility* is the degree to which a group's activities are marked by informal procedures rather than by adherence to rigidly structured procedures.
4. *Hedonic Tone* is the degree to which group participation is accompanied by a general feeling of pleasantness or agreeableness.
5. *Homogeneity* is the degree to which members of a group possess similar characteristics.
6. *Intimacy* is the degree to which members of a group are familiar with the personal details of one another's lives.
7. *Participation* is the degree to which members of a group apply time and effort to group activities.
8. *Permeability* is the degree to which a group permits ready access to membership.
9. *Polarization* is the degree to which a group is oriented and works toward a single goal which is clear and specific to all members.
10. *Potency* is the degree to which a group has significance for its members.
11. *Size* is the number of members of the group.
12. *Stability* is the degree to which a group persists over a period of time with essentially the same characteristics.
13. *Stratification* is the degree to which a group orders its members into status hierarchies.
14. *Viscidity* is the degree to which members of the group function as a unit.

College students were asked a series of open-ended questions descriptive of groups, and from these responses 1100 descriptive items were constructed. Then, five judges screened the items and classified them according to their relevance to the 14 proposed dimensions. The result was a reduction of the number of items to 355. The number of items falling in each category ranged from 9 in Hedonic Tone to 47 in Permeability. (Size of group, of course, had only one question.) Following, 200 subjects (college students) gave descriptions involving 35 different groups in terms of the 355 items. Campus groups comprised most of the list described and the groups ranged in size from 6 to 27,000. Corrected estimates of split-half reliability of the dimensions based on 100 respondents ranged from .59 to .87. An internal consistency check based on responses from all 200 subjects was done by correlating with each dimension score: (a) the constituent items, (b) items previously judged relevant but not satisfying the

TABLE 1  
*Intercorrelations among Fourteen Group Dimension Scores\**

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Autonomy													
2. Control	-.06												
3. Flexibility	.29	-.29											
4. Hedonic tone	.16	-.37	-.16										
5. Homogeneity	.12	.10	-.02	.40									
6. Intimacy	.12	.19	-.21	.38	.31								
7. Participation	-.25	-.12	-.25	.38	.12	.21							
8. Permeability	.46	-.29	.07	.19	-.02	.10	-.53						
9. Polarisation	.03	-.02	-.31	.40	.28	.19	.49	-.10					
10. Potency	-.34	.03	-.46	.25	.07	.28	.69	-.51	.34				
11. Size	.03	.19	-.46	.07	-.16	.10	-.10	.19	-.16	-.02			
12. Stability	.00	-.19	.25	.19	.25	-.02	.00	-.06	.28	-.16	-.54		
13. Stratification	-.40	.21	-.10	-.49	-.31	-.12	.29	-.51	-.16	.34	.10	-.12	
14. Viscidity	.19	-.46	-.02	.81	.38	.03	.38	.16	.38	.10	-.16	.21	-.46

\* The probability of securing a correlation value of .29 or larger by chance is .01. This table corresponds to Table 5 in (13).

arbitrary conditions for inclusion, and (c) five randomly selected from other scales. The median correlations with the dimensions by items so chosen were respectively .36, .15, and .12. Descriptions of the same groups by different respondents were compared and substantial agreement was noted.

The scores of the 35 groups on each dimension were intercorrelated using tetrachoric coefficients. Their results are shown in Table 1.

With respect to these results the authors commented that "While the majority of the intercorrelations among dimension scores are small enough to meet the criterion of independent dimensions, others were considered high enough to demand further attention." Following the analysis described above, the authors made some revisions of the scales to reduce overlap among the measures but reported that there was probably a substantial overlap among such dimensions as Viscidity and Hedonic Tone, or Participation and Potency. The intercorrelations among the revised scales were not reported.

While we could not do a factor analysis on the revised scale scores, it is of interest to note that a complete centroid analysis of the matrix given in Table 1 showed it to contain four relatively substantial factors which jointly accounted for 58.4 per cent of the total variance of the dimensions. The communalities ( $h^2$ ) ranged from .30 to .91, suggesting that even the most independent scale appreciably overlaps other scales in the matrix. The rotated factor matrix is shown as Table 2 and the four factors separately listed with variables on which loadings of |.40| or greater occur. Tentative descriptive names, even though awkward, are attached to them.

Since the number of items per scale used by Hemphill and Westie is

TABLE 2  
*Rotated Factor Matrix*

	1	2	3	4	$h^2$
1. Autonomy	.23	-.51	.20	.09	.36
2. Control	-.55	.12	.49	-.23	.61
3. Flexibility	-.08	-.38	-.19	.56	.50
4. Hedonic tone	.91	.07	.25	-.13	.91
5. Homogeneity	.29	.03	.58	.12	.44
6. Intimacy	.23	.10	.46	-.15	.30
7. Participation	.34	.81	-.05	.14	.79
8. Permeability	.27	-.72	-.02	-.18	.62
9. Polarization	.40	.36	.31	.15	.41
10. Potency	.20	.80	.05	-.17	.71
11. Size	-.05	-.10	-.05	-.81	.67
12. Stability	.15	.00	.15	.63	.44
13. Stratification	-.44	.54	-.28	-.06	.59
14. Viscidity	.90	.04	-.00	.09	.82
					$\bar{x} = 58.4$

already large and the corrected reliabilities reported for the scales account, in a simple average (sum of squared reliabilities), for about 57 per cent of the variation, the hypothesis that the 14 scales are orthogonal cannot be supported. However, a comparison of the reported reliabilities with the factor loadings will indicate that the estimate of reliabilities may be low and, concomitantly, that the four extracted factors leave considerable room for several unique factors.<sup>3</sup> We conclude, therefore, that in the original matrix of items there are more than four factors, but the existence of 14 orthogonal scales is not demonstrated. Thus, the concepts for scale construction, while they may have had meaningfulness in a "sociological or psychological framework," also may have forced the empirical data to fit them rather than modifying themselves to fit the data.

But we are not so much concerned with this possible shortcoming of the Hemphill and Westie study as we are with indicating its value in providing leads to further productive effort.<sup>4</sup> Certain things should be considered in future investigations.

<sup>3</sup> In some cases the  $h^2$  is low while the reliability is high, indicating the independence of the variable. On the other hand, the relationship reported between Hedonic Tone and Viscidity is either too high, or the reliabilities reported are too low, or both. This is seen when the correction for attenuation is made and the corrected statistic accounts for more than 100 per cent of the variance.

<sup>4</sup> Shortly before this paper went to press the recent publication by Hemphill (14) was brought to our attention. In this monograph Hemphill reviews five applications of the Group Dimensions Description Questionnaire, which was based on the Hemphill and Westie study (13). This questionnaire is available through the Educational

## FACTOR 1\*

*Task Focused Agreeable Cooperativeness vs. Disagreeable Control**Loading*

4. Hedonic tone	.91
14. Viscidity	.90
2. Lack of control	(-).55
13. Lack of stratification	(-).44
9. Polarization	.40

\* The sign in parenthesis is the one which occurs in the factor table.

## FACTOR 2

*Responsible Membership Commitment vs. Self-Structured Commitment**Loading*

7. Participation	.81
10. Potency	.80
8. Lack of permeability	(-).72
13. Stratification	.54
1. Lack of autonomy	(-).51

## FACTOR 3

*(Peer) Primary Groupness vs. Secondary**Loading*

5. Homogeneity	.58
2. Control	.49
6. Intimacy	.46

## FACTOR 4

*Size: Small Informal vs. Large Formal**Loading*

11. Small size	(-).81
12. Stability	.63
3. Flexibility	.56

1. The attempt by Hemphill and Westie to apply their definition of a group was probably a mistake.<sup>5</sup> At this stage the most inclusive definition

Testing Service, 20 Nassau Street, Princeton, New Jersey. In one of the studies reviewed a factor analysis of the group dimensions is reported, and in this case the three rotated factors retained account for 49 per cent of the total variance. The factor structure indicated is quite different from that reported here. This difference may be accounted for in part on the basis of changes in the items, but it may also be related to the sensitivity of the measures to sampling variation.

<sup>5</sup> The authors accept a rather confining definition of a social group, taken from Smith (15), as "... a unit consisting of a plural number of separate organisms (agents) who have collective perception of their unity and who have the ability and tendency to act and/or are acting in a unitary manner toward their environment."

should be used. The authors themselves suggest difficulty with their definition and indicate that some conception of degree of "groupness" might better be employed rather than a group—not-group dichotomy.

2. Distinguishing between groups and other collectivities is of no utility at this stage. The essential problem is to identify basic dimensions in terms of which any interactive situation may be described. Meaningful classifications may emerge later but these will be identified by particular score configurations or profiles.

3. The Hemphill and Westie study contributes an important corrective to the tendency occasionally found to "throw everything in the hopper" of factor analysis with the apparent expectation that meaningful structures will somehow result. The work of these authors suggests the desirability of a much more systematic approach to sampling a universe of items descriptive of collective behavior. *The problem is on the one hand to avoid a primitive empiricism and on the other to avoid being limited by confining theoretical frames.* Probably a good compromise could be to range widely for theoretical formulations and to extract as many implied descriptive items as possible from each. As an additional means of ensuring coverage the list thus constructed could be checked against the lexicon of adjectives referring to social entities to see whether or not experience embodied in the language indicates other items or dimensions.

4. The Hemphill and Westie procedure supplemented by factor analytic procedures to locate the dimensions (rather than assuming them) constitutes a promising pattern of attack on the problem.

5. Other studies should also be conducted, both for replication and extension of generality of findings. Some possibilities are:<sup>6</sup>

a. Replication of the Hemphill and Westie study of campus groups with the effort to ensure inclusion of all the more formalized groupings and a large sample of the informal groupings, friendships, ephemeral mass groups, etc.

b. The selection of special readily identifiable classes of aggregates such as the family and covering as wide a range of kinds of relationships as possible within that category.

c. The study of diadic friendship pairs.

d. The study of the range of group-life situations of individuals in routine living experience.

With a little reflection the reader can, of course, greatly extend this list of suggestions stimulated by the approach made by Hemphill and Westie. We can now turn to the second of the pilot studies which we wish to discuss.

\* Several studies on the dimensions of groups are projected at the New York University Graduate Department of Sociology.

*Cattell*

The work of Cattell in the classification of both persons and groups is well known, and he has been a leading exponent of factor analytic approaches to the classification problem. He has provided a number of well-formulated statements of the requirements for the classification of groups (4, 5), but here we shall consider only a part of the theoretical position he takes.

For the classification of groups to be maximally effective, Cattell suggests that the measures used should constitute an array which is "very catholic and highly varied." By indicating that one should be aware of the "degrees of homogeneity of population" on which a classification study is done, Cattell also points to the need for replication and for overlapping studies. However, in this light his definition of a group is not entirely clear. A group is "... an aggregate of organisms in which the existence of all is utilized for the satisfaction of some needs of each." Using this definition, an aggregate would need to be examined in each case to see if "some needs of each" are satisfied before it is called a group, a requirement which might make the definition more difficult to utilize than others. However, if "satisfaction of some needs of each" is defined to include potential satisfaction, the definition may be made as inclusive as one wants. As with Hemphill and Westie, the end product of Cattell's research is profile classification so that the problem of defining a group is not crucial unless the definition is restrictive.

Central to Cattell's work is a distinction in the classes of variables which are to be considered. He identifies three panels as exhaustive: (5)

These three panels exhaust all the kinds of observation, i.e., all the data, measurable or qualitative, which can be collected with regard to a group as the reference point. The first panel is quite simple: population variables or dimensions are merely *means (or other statistical parameters) of the measured characteristics of the component individuals*, such as the mean I.Q., mean stature, etc., of the component members. These are clearly distinct from the characteristics of the group as a group, which arise by interaction, for they can be measured in the individuals before they become a group. By *structural variables* or dimensions we mean the descriptions of the internal behavior of the group, such as the status gradients, the clique relations as revealed by sociometry, the reciprocal role relations, the form of leadership structure, and, in organized groups, what Stogdill has called "the sociometry of working relations in formal organizations." These are inferred from observations on the internal interactions, processes, and procedures of the group and they are often quite high level abstractions involving such complex concepts as status and leadership structure. The third category comprises the true *syntality variables*, which represent the *performances of the group acting as a whole* and commonly through its executive, e.g., its decision in a committee-like situation, its constructive performance on a building task or its acts of aggression or assistance towards other groups.

The only difficulties so far found with these three panels lies (a) in finding a place among them for the concept of cultural tradition and (b) in distinguishing sufficiently sharply between structural and syntality variables. In regard to the first it must be said that the culture pattern lies in all three panels: it exists in the personality of the individuals and therefore in the mean population characteristics, it expresses itself in the structure adopted by the group and therefore ultimately in the group behavior, i.e., in the group syntality. Thus the culture pattern is a different order of abstraction from the other three.

The second difficulty—that of drawing a clear and functional division between structure and syntality variables or dimensions—is solved if we bear in mind that the former are always statements of relations among (the behavior of) group members. Outstanding among structure variables are those statements which are about the relation between the behavior of one person—the leader—and the behavior of the rest. Only statements about relations which include all members of the group constitute adequate descriptive parameters of structure. On the other hand observations of internal interaction of the whole group which do not involve relations are not in the structure panel but in the syntality panel. For example, the total number of words spoken per hour within the group is a characteristic of syntality, not structure, as also would be the ratio of criticisms to suggestions for the group as a whole. But a sociometric study of communication which showed that the group had four subgroups within it would be a statement about structure. Structure variables are in general of a higher order of abstraction than syntality variables; but structure and syntality variables are equally attributes of and statements about the group, while population measures have to do only with the people in the group.

A further difference of structure and syntality is that the former can be manipulated in experiments as the "independent variable" by introducing rules affecting the manner of internal interaction, e.g., the absoluteness of leadership. Further, less essential differences are that syntality variables can often be inferred without seeing the group as a whole: one may observe the construction job before and after the group's visit, to determine its productivity, or speak to its ambassador to determine its attitude toward another group. But to determine a structure variable, such as the social distance between classes, or the lines of hierarchical communication, one must observe internal interaction.

The relationships that exist among the data from these three panels of observation and systematization await the verdict of empirical investigation, but it is nevertheless possible to explore a priori certain major probabilities. The primary relation to be expected is that the population measures, which are a mere mean of the population level on such personality factors as general intelligence, schizophrenia, surgency, and desurgency, when properly combined with statements regarding the structure of a group, should enable one to predict the syntality, that is to say the performance, of the group, in any one of a number of fields. Except where structure is imposed artificially by an experimenter or from the past by tradition, the personality measures, in conjunction with the environmental circumstances, should theoretically enable us to predict both the emergent structure and the syntality (group performance) measures that follow from it. But there will also be circular and feedback influences. For example, the success with which a group tackles a certain job, i.e., its measure on a syntality dimension or trait, is in turn likely to influence the way in which the group organizes itself. And the way in which a group organizes itself may again influence the mean level of the group's possession of certain individual personality traits.

While Cattell is obviously aware of a number of difficulties in distinguishing the three panels, there are additional ambiguities which are not easily dismissed and which need to be emphasized. For example, the performance of persons in a group might be accounted for by population measures. If the characteristic performance of persons indicated by such a variable (used by Cattell, Saunders, and Stice) as "dynamometer sustained pull," to select one illustration, correlated substantially with group performance and both correlated the same way with a given factor structure, it would be difficult to describe the group performance as a "syntality variable." At minimum, it would suggest that the characteristic of the group is to be accounted for in part by the population measure. As a further example, if it should turn out that the total amount of talking a group does is a function of the mean amount of talking done by members of the group characteristically as persons (i.e., in all group situations), it would be difficult to call the amount of group talking a syntal "emergent."

It is fruitful to regard the distinctions made by Cattell among population, structural, and syntality variables as suggestive rather than final. The suggestion serves to remind the researcher of the need for an *inclusive set of measures* on group behavior, and it also points to the possibility of "explaining" syntality characteristics through the structural and population panels. However, these emphases need to be further considered and extended, and this should be the natural product of additional systematic empirical exploration of group data. Here we may introduce a few additional refinements and questions.

1. Let us define a syntality characteristic simply as one associated with the aggregate which cannot be accounted for through parallel measures taken on the individual members of the aggregate. Thus, if we consider such a measure as the total amount of talking which is done in an aggregate in a given period of time as a variable, the syntality component is that which remains in the consistent performance of the aggregate once the total amount of talking which would have been expected on the basis of the mean performances of the individual members has been accounted for. Such a measure would presumably have both syntality and population components. In dealing with syntality characteristics, thus, the researcher should always take cognizance of the possibility that the measure associated with the aggregate may be (at least in part) directly "explainable" in terms of the parallel measure taken in terms of the characteristic performance of the individual members. To restate the issue, there is a characteristic performance of the aggregate as such, and there are characteristic performances (presumably over-all situations) of individuals, and the distinction between these two measures must be kept clear.

It should be evident, however, that the measures to which we have

alluded presume a parallel in the individual. For these measures we may suggest that the aggregate (among other things) defines the situation for any individual, and so may be viewed as accounting in part for the variation of the performance of the individual from aggregate to aggregate (situation to situation). In this and the previous statements we may recognize the intimacy and complete interdependence of the study of personality characteristics with that of syntality characteristics.

2. It is possible to understand the behavior of the aggregate in terms of individual measures which are not parallel. Here, however, we must at least provisionally think of the situation as one of emergence, i.e., certain characteristics associated with individuals result in certain *other* characteristics associated with aggregates. Once the "invariant" relationships between characteristics of the members and those of the aggregate are established, they may be used as any other invariants are in science, within their limits of error. It may be possible at some time to go beyond the invariant sequences found for "explanations" by breaking the variables up into more rudimentary measures, but we shall not concern ourselves with this additional reduction.

3. Measures on the *arrangement* of members of the aggregate may be considered to have counterparts in the members in certain circumstances. As a simple example, if the variance of amount of talking of the members of the aggregate is the measure, the direct counterpart is the variance of the members' characteristic rates (presumably over all groups). Similarly, the implicitly more complex measure of "democracy" in an aggregate has as its counterpart the mean characteristic action of the members in this regard, or possibly the mean characteristic perception of "how a group should run." Manifestly, qualitatively different arrangements which fall into a class definition, such as families, may have counterparts in arrangements of persons without the family definition.

4. The problem of the counterpart in the individual members of the characteristic of the group-as-a-whole should not be dismissed easily because measures are said to be unitary in regard to the group. For example, a "group decision" may be defined in terms of a vote. This may be considered a group product which is unitary because there is only one decision. However, votes may be taken in many different ways, and the parallel questions to individuals in regard to the vote may be phrased in as many ways. The group product which is said to be unitary should be examined for its counterpart.

5. One of the implicit assumptions which has favored the study of development of structure in ad hoc groups is that development decellerates with time, the greatest learning among members in regard to each other occurring at the earliest time. With reference to the developing group, the

difference between the aggregate at one point in time and at another point in time needs to be considered in terms of syntality. If a given product (such as talking rate) is measured at one point in time, and again at another point in time, the same measure is, by definition, another product (another variable). This is an important issue to consider, for the coming together of several persons in an aggregate may lead to the swift development of a number of group products—as swiftly as the communication of certain gross characteristics occurs among people, and the emergence may be much as one thinks of a chemical combination. On the other hand, there may be other products which are more closely analogous to processes such as growth or maturation. Both these kinds of products need to be considered as syntality characteristics.

6. Consideration of this last point requires us to note the reflected consequence of aggregate performance on population characteristics, and to emphasize the circularity of the personality-syntality dichotomy. Participation in aggregates has noticeable effects on the behavior of individuals. These changes in individuals as products of aggregate participation need to be considered as syntality variables.

We may summarize as follows: (a) There are measures which are associated with products of individual members and there are those associated with the aggregate itself. Aggregate measures which are based on the characteristic performances of the individual members (presumably taken over all relevant situations) may be considered *population* variables. Aggregate measures, to the extent that they cannot be accounted for as population variables (in direct parallel measures) may be considered *syntality* variables. Population and syntality variables are thus relatively defined. Further, changes in population variables attributable to social interaction should be regarded as syntality variables. (b) Syntality characteristics may arise swiftly in aggregates, as with chemical compounding, or may arise in processes analogous to growth, maturation, aging, etc. (c) Measures of aggregates may describe the arrangements of persons, and these variables, along with others, may not be capable of simple quantitative ordering. Where such difficulties arise in ordering, the discreteness of the qualitative categories must be considered, and studies replicated for each category. The situation is not different from the examination of uniqueness of characteristics of aggregates of different size. For example, the jump from size two to size three implicates many discrete differences; in size two there is only one way of having a majority, there is no mediator possible, etc.

#### Cattell, Saunders, and Stice

The research by Cattell, Saunders, and Stice (8), which was more comprehensive than the earlier Cattell and Wispe (9) study, is briefly

reviewed here. This study, extensive and ingenious, involved a sample of 80 groups of 10 men each, with 93 measures in the factor analysis. Fifteen factors were extracted from the matrix, and, recognizing the problem of interpretation, the descriptions of the factors were cautiously stated. The factor names are listed below. We have added additional comments, derived from the published paper, where it appeared appropriate.

Factor 1. *Vigorous unquestioned purposefulness vs. self-conscious unadaptedness.* This factor appears characterized on one pole by high feeling of being accepted in the group, of working toward a common goal, and by high performance and liking of coordinated vigorous action in well-defined tasks.

Factor 2. *Immediate high synergy vs. low motivation.* On one pole this factor is characterized by apparent high motivation, cohesiveness, and acceptance of a high degree of leadership.

Factor 3. *Democratic, explicit procedure-orientation vs. horde urgency.*

Factor 4. *Schizothyme rigidity vs. conformity to circumstances.* Schizothyme rigidity is here characterized by an apparent unadaptable and unrealistic aspiration level with rigidity in planning.

Factor 5. *High intrinsic synergy vs. low intrinsic synergy.* One pole of this factor is characterized by a high level of immediate enjoyment of the group life itself, by a high level of gregarious satisfactions.

Factor 6. *Intelligent role interaction vs. low morale 1.* One pole of this factor is characterized by a propensity for intellectual problems, mutual understanding and adaptability, and apparent acceptance of role differentiation.

Factor 7. *Democratic "savoir faire" vs. lack of self-possession.* This factor orders democratic organization on one pole and individual control on the other.

Factor 8. *High verbal interaction.*

Factor 9. *Recklessness.* Groups high in recklessness performed certain tasks (voting) quickly and concentrated resources on a few alternatives.

Factor 10. *Group elation vs. group phlegm.* One pole is characterized by high we-feeling, high freedom of group atmosphere, high motivation, and apparent slow considered questioning with quick arrival at solutions.

Factor 11. *Homogeneity of emotional maturity.* Homogeneity here is associated with optimistic aspiration and improvement in a task.

Factor 12. *Disregard of group vs. acceptance of group goals.* Disregard of group here refers to preference for impersonal activities, to dawdling and horseplay, with an apparent rejection of the group as a means to one's ends.

Factor 13. *Frustrating tempermental heterogeneity vs. morale from homogeneity.* Heterogeneity in certain personality characteristics appears associated with inability to agree on goals and how to achieve them.

Factor 14. *Difference in internal communications.* Low verbal interaction appears associated with quick performance on manual activities, though with little planning and inferior results.

Factor 15. *Anarchy* (Not clearly defined).

Full appreciation of the meaning of the factors can only be achieved through careful consideration of the original paper, and the reader is advised to make this worthwhile investment of time. We note that the authors are cognizant of limitations of the study which deals with one somewhat narrowly defined class of groups, namely groups of 10 persons each brought together for test purposes and for which motivation of performance as groups on tasks was provided by competitive awards (\$100). We emphasize here, in the context of considering the problem of classification as a general one, several kinds of interpretative limitations.

A first limitation of the study in terms of generalizations to other populations is the limitation of size to 10 persons in each aggregate. To illustrate, compared to a group of two, in a group which is as large as 10, it is possible for fine subdivision of roles among the members, and consequently for the members to seek anonymity or the particular roles in which they are more comfortable. In a group of two there is only one way in which a majority decision may be accomplished, while in a group of 10 there are many. In a group of three, a majority decision is either unanimous, or with one person (isolated) in a minority, while in a group of 10 it is possible for minorities to exist without isolation. These and additional considerations (1) suggest that generalizations about classifications of groups of 10 persons should not be hastily extended without replication in groups of other sizes.

A second limitation of the study is the difficulty of interpretation of the kinds of measures which were used. One can hardly criticize the selection for inclusion without proposing substitute items, and full recognition should be given to the ability to muster as wide a variety of tasks and measures as occurs in this study. On the other hand, the wide variety of measures may not be so easily or clearly interpreted as one might ideally desire when viewed in a factor structure. Let us examine the problem. The first factor presented by Cattell, Saunders, and Stice is descriptively called Vigorous unquestioned purposefulness vs. self-conscious unadaptedness. Fifteen variables are listed having a range in loadings from [.32] to [.69]. Among the 11 highest loadings there are 7 which are population means on the 16 Personality Factor Test. (Adventurous cyclothemia, Deliberate will control, Positive character integration, Dominance, Polished fastidiousness, Calm trustfulness, and Lack of nervous tension.) Now, since these appear to dominate the factor definition, we might suggest that they could be used to define the factor. How, then, would one identify the meaning of this factor except in terms of either the sample distribution or the suggestion that the tests are in fact fairly strongly interrelated in

individuals? The latter is a likely reason for the high covariation. In addition to the seven population means, among the top 11 variables are: (a) *Dynamometer*, jerking pull; Total pull; (b) *Discussion*: Dislike for group judgment situation; (c) *Discussion*: Preference for dynamometer situation; and (d) Felt acceptance by other group members. The four final loadings were: Wide range of independent self-sufficiency; Subject rating, commonness of purpose; Observer rating, many "principal" leaders; and Subject rating, members do feel free to participate. Assuming that the population variable means reflect contamination of tests, it is difficult to ascribe meaning to the factor in terms of (a), (b), (c), and (d). Looking over the entire range of variables, one can see the logic of identification of the factor, but this does not alter the difficulty of interpretation. The convenience of utilizing personality tests in which the characteristics have been measured in terms of orthogonal categories is emphatic here! If the personality tests were orthogonal, distributions of population variables would be expected to be random, and the occurrence of relationship among the tests could be interpreted as related to the syntality characteristics.

Whatever the limitations one sees in Cattell's work, it is apparent that the direction of experimental observation has been motivated. One may question the kinds of tasks set for the groups of 10, particularly since group behavior is not always or possibly even not often one which is testing performance of a group as a group. One may question the selection of subjects. One may question the size of group. And there are a number of other limitations which may be indicated; but these should be regarded as suggestions for replication studies rather than criticisms of the research.

#### *Additional Studies*

We have not discussed the Cattell and Wispe study (9) since we regard it as preliminary. However, one additional recent study may be mentioned in this connection (2). In this study 166 three-man groups were observed, each participating for a single short session of 48 minutes, half the time in a situation designated as actual behavior and the other half in a situation designated as role playing. Seven factors were extracted as follows:

Factor 1. *Tension-neutral activity*. Members operate under tension but respond in patterns of emotionally neutral activity.

Factor 2. *Involvement activity*. Activity indicates emotional involvement with relative absence of tension.

Factor 3. *Group identification*.

Factor 4. *Leader-structure*. Groups high on this factor appear to have clear allocation of roles, a sense of direction, and unambiguous leadership.

Factor 5. *Discussional involvement*. Members get involved in much discussion at an intellectual rather than emotional level.

Factor 6. *Task interest.* Preoccupation with task is accompanied by corresponding lack of interest in other group activities.

Factor 7. *Maturity of members.* Groups more mature in age and military grade show less tension and antagonism, more agreement or acknowledgement.

#### DISCUSSION

Our general review of empirical approaches to the study of groups indicates a paucity of work in the area. If we attempt to examine the possible overlap of the studies presented, as indicated in Table 3, we note the completely tenuous status of any generalization from one study to another. The differences in factor names are not only characteristic of the differences in variables used, but also a reflection of the early stage of experimentation with groups. The situation is analogous to that in personality research which produced many factor names which are now in process of being narrowed down. Because classification of groups is recognizable at this early stage, it is valuable to emphasize some of the lessons learned in the personality area.

The most obvious lesson, already apparent in our Table 3, is the value of using marker variables, that is, variables which are identical in manifest definition and can thus be used to tie one analysis to another. The extraordinary need for this becomes apparent in the review by French (12) in the personality area. Although he reduces the number of factor names from 450 to about 50 which appear to occur in two or more studies, there is little question that considerable overlap remains. His screening procedure was one of careful examination of the psychological meaning of the factors and the contents of the items. A second and consequent lesson may be read as follows: It is difficult to reduce the number of variables to a stable set with factor analytic procedures. These convenient tools, however, are the most powerful currently available. One may therefore anticipate that classifications which do not have the assistance of arbitrary tools which can reduce empirical data to manageable proportions will not be so firmly grounded. This does not mean that such classifications are not of use, but only that they should be considered provisional and awaiting rigorous testing. This is by no means to set aside thought and judgment in the design of research. Because the tools are available the strategic step would seem to be the direct accumulation of empirical data which may become the basis for classifications from which revision of the theory in the area may take place.

A third lesson is so universal in science that it can always be usefully repeated. Studies must be replicated, and replication should be oriented to the testing of generality of findings as well as their stability.

We may conclude with a few additional comments. The generality of any classification is limited by definitional bounds. In general, when persons

TABLE 3  
*Possible Convergences of Empirically Derived Group Classifications*

Cattell, Saunders, and Stice	Hemphill and Westie	Borgatta and Cottrell
1. Vigorous unquestioned purposefulness*	9. Polarization	6. Task interest
2. Immediate high synergy	7. Participation, 10. Potency, and 13. Stratification	4. Leader-structure
3. Democratic explicit procedure orientation vs. horde urgency	3. Flexibility	1. Tension-neutral activity
4. Schizothyme rigidity	14. Viscidity, and 4. Hedonic tone	3. Group identification
5. High intrinsic synergy	2. Control	5. Discussional involvement 2. Involvement activity
6. Intelligent role interaction vs. low morale 1.*	5. Homogeneity	7. Maturity of members
7. Democratic "savoir faire" vs. lack of self-possession		
8. High verbal interaction		
9. Recklessness		
10. Group elation		
11. Homogeneity of emotional maturity		
12. Disregard of group*		
13. Frustrating temperamental heterogeneity		
14. Diffidence in internal communications		
15. Anarchy		
	1. Autonomy† 6. Intimacy† 8. Permeability† 11. Size† 12. Stability†	

\* Apparent overlap to the Cattell and Wispe study is reported.

† These are essentially held constant by the laboratory conditions of research in the other two studies.

have talked about the classification of groups they have not always meant the same things. Sociologists, for example, have frequently implied in their definition the restriction to "natural" groups of persistent duration and have emphasized ad hoc categories of a qualitative phenotypical sort. On the other hand, the emphasis implicit in this review follows in the wake of formal sociology. Here we might more appropriately suggest that we are dealing with the classification of "interaction fields" or "interaction situations," or with "aggregate behavior." It is important to recognize the assumption of definitional limits. Particularly at this early stage of em-

pirical exploration, it is suggested that the most inclusive definition of the "group" is the most appropriate. The study of *relevant stable factors* for the classification of behavior of persons in aggregates should in the end be inclusive of all aggregates.

It is our conviction that the tools are developed, the shortcomings of theory and research are evident, and the opportunity now exists for replicating and cumulative research.

*Manuscript received: July 12, 1956*

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## A Behavioral Assessment of Persuasibility: Consistency of Individual Differences<sup>1</sup>

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A number of recent investigations (1, 3, 4, 5, 6) have been concerned with individual differences in responsiveness to persuasive communications and have raised the possibility that there may be a general factor of susceptibility to persuasion, or "persuasibility." The latter term does not refer to attitudes predisposing the individual to accept or reject communications which favor a *particular type of conclusion*, but rather to those attitudes or personality factors leading to low or high resistance to a *wide variety of persuasive communications on many diverse topics*. The existence of one or more general factors of susceptibility to persuasion would imply that some individuals tend to be indiscriminately influenced by the many persuasive communications to which every modern urban community is continually exposed, while other individuals tend to be generally unresponsive to such communications.

Previous studies bearing on general persuasibility have been limited in scope and in generality because of their use of a small number of communications, relatively homogeneous in argumentation and in type of persuasive appeal. An initial study by Janis (5) used three communications which dealt with different topics, but which were relatively homogeneous in that they all advanced predictions of future events and used logical argumentation rather than other possible persuasive appeals (e.g., fear-arousing appeals or prestigeful endorsements). A second study by the same author (6) used five communications which were heterogeneous in content, but all of them were again limited to predominantly logical argu-

<sup>1</sup> The present research study was conducted in connection with an undergraduate research stipend which was awarded by the Social Science Research Council to the junior author in the summer of 1954. The study was carried out under the auspices of the Yale Communication Research Program, which is supported by a grant from the Rockefeller Foundation and which is under the general direction of Professor Carl I. Hovland, to whom the authors are indebted for valuable suggestions and criticisms. Special thanks are also due Dr. Robert P. Abelson for advice on problems of statistical analysis and for valuable suggestions concerning the formulation of the factor analysis findings. The authors also wish to express their thanks to John Forsythe, Lawrence Hilford, and Joyce Montgomery, who assisted the authors in administering the tests; and to Eileen Beier, who carried out the factor analysis computations. The data for this study were obtained from the Milford High School in Milford, Connecticut, and the authors are deeply grateful to Mr. Herbert R. French, principal of the high school, and to the social science faculty for their helpful cooperation.

mentation. Both studies were conducted with male college students and the results supported the conclusion that there are consistent individual differences in persuasibility which are related to personality factors such as feelings of personal inadequacy.

One of the main questions which the present investigation was designed to answer is the following: Are individual differences in susceptibility to persuasion consistent enough to warrant the assumption that there is a more or less general factor of persuasibility? To help answer this question we have developed a test for assessing a person's susceptibility to persuasion, modeled after the behavioral measures of persuasibility used in Janis's earlier studies (5, 6). The method consists of three steps: first, the subjects are given an initial attitude test; next they are exposed to a series of persuasive communications; then, they are given a postcommunication attitude test to determine the degree to which their attitudes change in the direction of the communicators' conclusions.

The new test of general persuasibility to be described in the present paper differs from the ones used in the earlier studies in the following important respects: the series of communications used is much larger and represents a much wider variety of topics and of persuasive appeals. By administering the new test to a large sample of subjects, it was possible to examine the consistency of opinion changes in response to the various different communications. If specific topic-bound predispositions are the only major factors which determine individual differences in responsiveness to persuasive communications, correlations close to zero should be found among the resulting opinion changes. A different prediction follows from the hypothesis that there is a general factor (or set of factors) underlying individual differences in susceptibility to persuasion. According to this hypothesis, the resulting opinion changes will be positively intercorrelated: those persons who are most strongly influenced by any one of the persuasive communications should show a tendency to be most strongly influenced by each of the others, irrespective of the particular subject matter.

The present report will be devoted to describing and discussing the evidence pertaining to test reliability and the consistency of individual differences in persuasibility. A later report will deal with additional evidence bearing on potential sources of consistent individual differences—sex differences, I.Q. differences, and various motivational factors that predispose a person to high or low susceptibility to persuasive communications.

#### METHODS AND PROCEDURES

##### *The Persuasibility Test*

The new test of persuasibility consists of three different components: (a) the "Before" questionnaire designed to measure initial opinion on 15

different items; (b) Booklet I, a mimeographed booklet containing five persuasive communications on five different topics, each of which is followed by three pertinent questions identical with three of the questions included in the Before questionnaire; and (c) Booklet II, a second series of five persuasive communications on exactly the same topics as the first series but taking diametrically opposite positions to those taken in the first series. After each communication in Booklet II the subjects are given the same opinion questions which they had answered earlier in the Before questionnaire and in Booklet II. Thus, at three different times the subjects are asked to express their opinions on the pertinent issues discussed in the persuasive communications: the first time, before any communication is presented; a second time, after reading the initial set of communications (Booklet I); and a third time, after reading an opposing set of communications (Booklet II).

The persuasibility scores obtained from the test are based on a total of 30 questions (3 questions for each of 10 communications). The method of scoring will be described below.

In Booklet I, the articles present various types of arguments and persuasive appeals in support of the following main conclusions:

1. The U. S. Civil Defense organization should be greatly expanded to include 25,000,000 men and women.
2. An effective cure for cancer can be achieved within one or two years if an all-out research effort is made; about 50 per cent of all medical research specialists should concentrate on this task.
3. General Von Hindenburg, president of the German Republic after the First World War, was a democratic leader and a great statesman.
4. Radio stations should (and soon will) cut down on the amount of classical music they dish out because it is dull stuff, strictly for the long-haired highbrows and stuffed shirts.
5. Jack O'Keefe, a corny comedian who is trying to break into TV, is not worth watching and his TV show will be a complete flop.

In Booklet II, the same type of argumentation and persuasive appeals are used to support the opposite conclusions; e.g., the civil defense organization should be cut down to about 2000 well-trained people so that our main defense effort can be concentrated on using our air power; a cure for cancer cannot be expected for at least 30 years and it would be a mistake to take scientists away from other, more promising tasks to work on this one; and so on.

In addition to the wide range of topics covered in each booklet, there is also a wide variety of special persuasive appeals. An attempt was made to include representative examples of major types of persuasive appeals currently found in mass communications, ranging from the logical argumentation employed in the communications about cancer research to the hy-

TABLE 1  
*Subject Matter and Special Appeals Used in the Persuasibility Test Communications*

Topic	Communicator's position		Special appeal used in pro and anti communications
	Booklet I	Booklet II	
1. Public participation in Civil Defense effort	Pro	Anti	Fear-arousing threat statements (e.g., danger of unpreparedness, destructiveness of atomic warfare)
2. Expansion of cancer research	Pro	Anti	Logical arguments and specialized information (citing expert scientific opinion)
3. General Von Hindenburg	Pro	Anti	Stereotyped characterizations (over-idealized hero or exaggerated villain)
4. Classical music	Anti	Pro	Social incentives (predictions that the given preference will be a means of attaining social approval)
5. A new television comedian	Anti	Pro	Hedonic incentives (predictions that the given choice will lead to enjoyment or nonenjoyment.)

perbolic, stereotyped journalism in the comments about the television comedian. Table 1 summarizes the topics and the main types of appeal used in the ten communications.

In selecting the communication topics, care was taken to avoid such possible confounding dimensions as a consistent "liberal" or "intellectual" position, or a consistent tendency to believe the good or the bad about people. Moreover, it was for the specific purpose of avoiding correlations with specific ideological predispositions that we included the subjects' opinion changes in response to communications presenting both the pro- and anti- position on each issue in arriving at the over-all persuasibility score. A person agreeing with both the pro- and anti-communication on a given issue would be likely to do so not because of some specific preference for one side of the issue, but rather because of a general tendency to accept the communications regardless of the initial attractiveness of their conclusions. Thus, the inclusion of opposing communications in the persuasibility test should help ensure that positive correlations among opinion changes will not be attributable to some tendency to accept either all pro- or all anti- communications, or to accept a given set of ideologically related opinions, but will reflect a more general persuasibility tendency.

We attempted also to vary the degree of structuring with respect to the subjects' previously formed opinions and amount of prior knowledge. The communications range from those on which the subjects could be expected to hold definite initial opinions (e.g., preference for classical music) to those on which they could have no previous opinions (e.g., the unknown

television comedian). One of our initial assumptions, which is tested in the present study, was that if a general factor of susceptibility to persuasion is present, consistent individual differences should be found on all topics but should show up most strongly on the *unstructured* topics, i.e., those for which initial opinions are not based on familiarity with the nature of the issue or on prior information about the pros and cons. For instance, with high-school students one would expect that opinion changes on the Von Hindenburg and the unknown comedian communications would be the most sensitive indicators of any general persuasibility tendency.

Every one of the ten communications, whether pro or con, took a sufficiently extreme position to ensure that practically none of the subjects would initially agree with the position advocated by the communication. It should be noted that any question or communication which yielded complete acceptance or complete rejection would not have been satisfactory for our purposes, because it could not be used to study individual differences in susceptibility to persuasion. The communications and questions were repeatedly revised on the basis of successive individual and group pretests so that (a) the communications would be intelligible and interesting to high-school students, and (b) the questions could differentiate subjects who were influenced by the communications from those who were not.<sup>2</sup> From a preliminary analysis of the changes in opinion produced by the communications in a sample of 100 cases, it was found that on all 30 post-communication questions a significant degree of change occurred.

#### *Procedures for Investigating Consistency*

The persuasibility test was administered to approximately 185 high-school juniors in their history classes. The Before test questionnaire and Booklet I, including the second questionnaire, were administered successively in the same session; Booklet II, including the third questionnaire, was administered a week later. For each class, the regular teacher intro-

<sup>2</sup> The three questions included for each communication were to some extent redundant, but not completely so because they covered somewhat different aspects or implications of the main conclusion. For example, after exposure to the first communication in Booklet I and in Booklet II, the following questions were asked:

a. During the past year there have been several million men and women serving as volunteers in the United States Civil Defense Program. During the coming year, how many people do you think the United States *should* have as volunteers in civil defense work?

b. Do you think the United States ought to spend more money or less money than it spends at present on civil defense?

c. If it ever happens that American cities are attacked by atomic bombs, how much help do you think a large civil defense organization would be with respect to saving lives?

Copies of the entire questionnaire and of the ten communications used in the Persuasibility Test are available upon request from the authors.

duced the experimenter as a member of a university research organization "which is conducting studies in this and other high schools throughout the state." The experimenter administered the Before test and then gave a standardized introduction, explaining the material in Booklet I.

The subjects were informed that the articles were written by reporters presenting their opinions on controversial, newsworthy topics. Each communication and both booklets were headed with the title "Opinions in the News" and with a by-line designed to impress upon the reader the fact that the communications had been written by reporters. The students were told that the experimenter wanted to know whether they agreed or disagreed with the articles, and they were instructed to express their own personal opinions on the questions following each article. They were also assured that their answers would be kept strictly confidential and would not be seen by the teacher or by anyone else at the school. In order to avoid implicit or explicit pressure for opinion change, the following instructions were given orally by the experimenter, immediately after the subjects had finished filling out the first (pre-communication) questionnaire:

Now I am going to ask you to read some articles on the topics that I have just asked you about. I would like you to answer some more questions about your opinions after you have read these articles.

I am giving you the articles to show you what some other people are thinking about these matters. You are perfectly free to agree or disagree with these articles, of course. After you have read each article you will be asked whether you agree or disagree with it. Remember, I want to know what you think, so give me your own personal opinion.

The articles that you're going to read have been taken from a professional news service. This news service brings together articles about opinions in the news today.

There are many different opinions about these different subjects. The reporters who wrote the articles you're going to read have put down their own points of view. There are other people, of course, who think differently about these topics. For instance, my own personal views do *not* happen to agree with certain of these articles, although there are some other articles with which I am inclined to agree.

Now if I showed these articles to a lot of people in [name of city]—including for instance all the teachers in this high school—I would get a good deal of disagreement. The average person would probably agree with some of the articles and disagree with others. These articles are on matters of opinion, you see, and some people have one opinion while others have a different opinion about each topic. So feel free to decide *for yourself* whether you agree or disagree with each of these articles.

Please read these articles the same way you would read an article in a magazine or a newspaper, and then answer the questions about your own opinion.

Similar instructions were used when Booklet II was administered, one week after Booklet I.<sup>3</sup> Three weeks later a personality questionnaire was

<sup>3</sup> The introduction for Booklet II included the following:

I have come here today to ask you to read some more news service articles of the same kind you read before. You remember that last week you read some articles in

administered by the high-school teachers to the same students. Included in this questionnaire were items asking the subject to rate himself on his general susceptibility to influence by mass communications (newspaper articles, radio and television programs) and his tendency to conform with the opinions of his friends.

#### *Scoring of the Persuasibility Test*

A persuasibility score was assigned to each individual to represent his opinion changes in response to the communications in the two booklets. This score was the sum of the number of questions on which the subject changed from his Before test position in the direction advocated by any given communication. (About 3 per cent of the cases failed to answer 2 or more questions out of the 30 and were eliminated from the sample; persuasibility scores for cases with one or two "no answer" responses were prorated.) Changes in the negative direction (i.e., in the direction opposite to that advocated in the communication) rarely occurred and did not exceed 10 per cent on any item; they were counted the same as no change, or zero. There was no differentiation in this method of scoring with respect to magnitude of change: a change of one unit received a score of 1 just as would a change of many units. The main reason for adopting this procedure is that there is no simple way to equate the *magnitude* of change on one question with that on another, especially since about half the ques-

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which newspaper reporters expressed their opinions about topics in the news today. As you were told last week, there are many different opinions on these topics. Today you will read some articles by some other reporters who take a different point of view on these matters.

The Opinion News Service gives a chance for many different viewpoints to be expressed, and so they often put out articles by writers who take opposite points of view on the same topics. I am going to ask you to read these new articles and then answer the same questions as before, after you've read the other side of the story and after you've had a chance to see what some of the different opinions are on these topics.

Let me remind you that you are perfectly free to agree or disagree with these articles, and you will be asked whether or not you do agree with each article after you have read it.

As I mentioned last week, if I showed any of these articles to people here I would probably find a good deal of disagreement. Some people would agree and others would disagree with each one. As for myself, I agree with some of the articles and disagree with some others.

Remember, you should decide *for yourself* whether you agree or disagree with each of these articles. Please read the articles in the same way you would read an article in a magazine or newspaper, and then answer the questions about your opinions.

And remember, all your answers will be kept strictly private in our study and none of your teachers will see any of your answers.

tions required the subjects to express their opinions as quantitative estimates, while the other half required the students to place a check mark opposite one of the verbal answer categories presented in a standard check-list.

Since only the direction of the change was counted, the scores on the persuasibility test vary from zero to 30, representing the number of items on which the subject changed his opinion in the direction of a conclusion advocated by one of the communications he had just read. The response to each question in Booklet I was examined in relation to the response given to the same question on the Before test. For each item on which the subject changed in the direction of the communication, he was given a score of 1; for each item on which he showed no change, or a negative change, he was given a score of zero.

The scoring of the opinion changes following Booklet II was somewhat more complicated. A simple scoring of change in the direction of the second communication on a given topic might involve a serious methodological error. On the basis of prior studies of the stability of opinion changes produced by persuasive communications (4), it is expected that as a result of forgetting and other processes opinions would tend to regress (from their level immediately following Booklet I toward their original level) during the week's time which intervened between Booklet I and Booklet II. Thus if the identical questions had been asked a week later, even without any intervening opposing communications, a change away from the position expressed immediately after exposure to Booklet I would probably have occurred. Such a change could give rise to spurious change scores that do not reflect accurately the individual differences in responsiveness to the persuasive communications in Booklet II. In order to minimize this source of error, the criterion of change after Booklet II was defined as a shift from the answer given on the Before test. If the individual had shown a positive change following the Booklet I communication, then, following the Booklet II communication he had to change all the way back to his original position, or beyond, to be scored as a change in the direction of the latter communication. Consider, for example, an individual who changes twice on the following opinion question: "What is your own opinion as to how much time the average radio station should devote to classical music each week?" Let us say that he changes from 30 hours to 15 hours after reading the anti communication in Booklet I, but then changes to 25 hours on the same question after reading the pro communication in Booklet II. The change following Booklet I would be scored as 1 but the change following Booklet II would be scored as zero because the individual failed to return to his initial opinion. This individual would have to change back to 30 hours or more to receive a positive score on the given question in Booklet II.

## RESULTS

*Split-half Reliability*

The reliability of the persuasibility test was investigated in a subsample of approximately 100 cases, constituting about two thirds of the total sample to which the test was administered. The subsample was a stratified random sample, including approximately equal numbers of male and female subjects. The split-half reliability was determined by giving each subject one persuasibility score on the 15 odd items and another persuasibility score on the 15 even items. Just as with the total scores based on all 30 items, the subtest scores represent the number of items on which the individual showed an opinion change (from the precommunication test to the postcommunication test) in the direction advocated by one or another of the communications. The raw reliability coefficient was found to be .69; the estimated value of the reliability coefficient is .81, when corrected by the Spearman-Brown formula. This finding indicates that the persuasibility scores are sufficiently reliable for making group comparisons.

*Item Analysis*

The internal consistency of the persuasibility test was studied in the same subsample of approximately 100 cases. Table 2 gives the results of an item analysis. It shows the results of plotting the changes on every item against the sum of the positive changes (or the "total persuasibility score"). The dichotomization of the total score was at the median. The dichotomization of item scores was between a change in the direction of the communication and no change or negative change.

Additional evidence of internal consistency is presented in Table 3, which shows tetrachoric correlations for each persuasibility subscore (on each communication of the persuasibility test) plotted against every other subscore on the test. Since there were three opinion questions for each communication, the scores for each communication ranged from zero (no positive change on any of the three questions) to 3 (positive change on all three questions). Dichotomizations were made so as to yield a split as close as possible to the median; the best split was found to be between scores of zero or 1 vs. 2 or 3.

Both the item analysis (Table 2) and the table of tetrachoric correlations (Table 3) clearly show a strong positive relationship among changes on the various topics comprising the persuasibility test. In Table 3, 39 out of 45 correlations are positive. Only 6 are negative, all very small and nonsignificant. The item analysis in Table 2 shows that 23 out of 30 questions are positively related to the total score at the .10 confidence level (two tail) or better; 11 out of 30 are significant at the .01 confidence level. Only 3 of the

TABLE 2

*Item Analysis of the Persuasibility Test: Chi Square for Score on each Item vs. Sum of Persuasibility Scores for Booklets I and II*

Topic	Item	Chi square (1 d.f.)	Confidence level (two tails)
I			
1. Pro civil defense	1	7.28	<.01
	2	5.84	.02
	3	5.92	.02
	4	1.64	.20
2. Pro cancer research	5	2.64	.11
	6	0.37	>.40
	7	8.40	<.01
3. Pro Von Hindenburg	8	5.73	.02
	9	12.35	<.01
	10	3.36	.08
4. Anti classical music	11	2.51	.12
	12	5.91	.02
	13	15.98	<.01
5. Anti TV comedian	14	37.35	<.01
	15	25.10	<.01
II			
1. Anti civil defense	16	4.19	.05
	17	6.08	.02
	18	5.77	.02
	19	9.28	<.01
2. Anti cancer research	20	3.22	.08
	21	7.88	<.01
	22	12.76	<.01
3. Anti Von Hindenburg	23	21.62	<.01
	24	5.79	.02
	25	2.48	.13
4. Pro classical music	26	00.01	>.40
	27	5.81	.02
	28	4.50	.04
5. Pro TV comedian	29	11.72	<.01
	30	0.81	>.35

NOTE: N = approximately 100, with an occasional decrement of from one to four cases because of omission of "no answer" responses.

30 items are very weakly correlated (above the .20 confidence level) but each of these was retained in the test because the very same question in the other booklet yields a significant relationship with the total score. No items correlated negatively with the total score.

The results indicate that for our sample of high-school students, the persuasibility test has a relatively high degree of internal consistency. The

TABLE 3

*Tetrachoric Correlations among Persuasibility Subscores from Each Communication in the Persuasibility Test*

	I-1	I-2	I-3	I-4	I-5	II-1	II-2	II-3	II-4	II-5
I-1 Pro civil defense	—	-.06	.50	.25	.22	.38	.05	.34	.21	.33
I-2 Pro cancer research		—	-.05	.10	.07	-.12	.14	-.12	.17	.16
I-3 Pro Von Hindenburg			—	.25	.31	.28	.05	.47	.25	-.07
I-4 Anti classical music				—	.44	.09	.05	.15	.23	.13
I-5 Anti television comedian					—	.50	.30	.52	.22	.27
II-1 Anti civil defense						—	.29	.49	-.08	.02
II-2 Anti cancer research							—	.30	.15	.27
II-3 Anti Von Hindenburg								—	.02	.27
II-4 Pro classical music									—	.33
II-5 Pro television comedian										—

NOTE: N = approximately 100, with an occasional decrement of from one to four cases because of omission of "no answer" responses.

findings support the general hypothesis that there are consistent individual differences in the opinion changes elicited by a series of diverse communications.

#### Factor Analysis

A centroid factor analysis was computed from the array of tetrachoric correlations shown in Table 3. The results are shown in Table 4. The proportion of the communality which enters into the first centroid factor is .60; this supports the assumption that the persuasibility test scores are determined to some degree by a single general factor. Three factors were found necessary, however, to account satisfactorily for the entire set of intercorrelations. These three factors were rotated obliquely and a clear simple structure emerged. On two of the rotated factors, denoted A and B, pro and anti communications on the same topic had similar loadings: either both were high positive or both were close to zero. This result, whereby pro and anti communications on the same issue cling together in the factor space, is in accord with the assumption that individual differences in opinion change are partially determined by factors other than the predisposition to develop a pro or anti attitude on the issue. The analysis indicates that there is a tendency for individuals to change either *both* ways on a given topic, or *neither* way. Factors A and B constitute two correlated clusters each showing this tendency. On factor A, both pro and anti communications on the following topics have high positive loadings (.35 or above): cancer research, classical music, and the new television comedian. Other loadings are negligible. On factor B, the four highest positive loadings occur on the following: the pro and anti communications on Von Hindenburg and civil defense.

As a preliminary interpretation of the difference between factors A and B, it is plausible to suppose that the factor A topics have directly favorable or unfavorable implications for the individual, while factor B topics are on more remote, impersonal political issues. A more extensive factor analysis using a much larger number of topics would be needed to test this possibility. In any case, factors A and B correlate .42 with each other, and thus may be construed as variations on a single theme, whatever their individual

TABLE 4

*Factor Analysis Results for Persuasibility Subscores: Centroid Factor Matrix, Rotated Oblique Factor Matrix, and Pearsonian Correlations between Factor Axes. (Based on Data in Table 3)*

## Centroid factor matrix (unrotated)

	I	II	III	Communality ( $h^2$ )
I-1 Pro civil defense	.58	.31	.24	.49
I-2 Pro cancer research	.10	-.41	.04	.18
I-3 Pro Von Hindenburg	.53	.41	.38	.59
I-4 Anti classical music	.45	-.19	.26	.31
I-5 Anti television comedian	.71	-.03	-.17	.53
II-1 Anti civil defense	.50	.39	-.32	.50
II-2 Anti cancer research	.40	-.15	-.35	.30
II-3 Anti Von Hindenburg	.63	.30	-.29	.57
II-4 Pro classical music	.39	-.32	.28	.33
II-5 Pro television comedian	.43	-.29	-.06	.27

## Rotated oblique factor matrix

	A	B	C
I-1 Pro civil defense	.05	.56	.47
I-2 Pro cancer research	.40	-.31	-.10
I-3 Pro Von Hindenburg	-.06	.62	.62
I-4 Anti classical music	.40	.06	.26
I-5 Anti television comedian	.41	.33	.00
II-1 Anti civil defense	-.06	.59	-.02
II-2 Anti cancer research	.34	.07	-.28
II-3 Anti Von Hindenburg	.09	.57	.01
II-4 Pro classical music	.48	-.08	.21
II-5 Pro television comedian	.48	-.04	-.07

## Correlations between factor axes

	A	B	C
A	—	.42	.00
B	.42	—	-.42
C	.00	-.42	—

interpretations. That theme is a general persuasibility factor which can be visualized as lying between factors A and B.

Factor C, which accounts for the least variance of the three factors, has high loadings on only two communications: pro civil defense and pro Von Hindenburg. The anti versions of these communications have negligible loadings, as do all other communications. Factor C is thus a more specific, content-bound factor than either A or B. Factor C correlates .00 with factor A and -.42 with factor B. No explanation is offered for factor C.

#### *Self-ratings*

The personality inventory, a 130-item questionnaire which was administered three weeks after the final part of the persuasibility test, included the following three questions for the purpose of obtaining the subjects' own self-ratings on susceptibility to *influence by mass communications*:

1. Do you usually agree or disagree with the articles that you read in newspapers and magazines?

(Agree with practically everything I read; Agree with most of the things I read; Agree with about half and disagree with half; Disagree with most things I read; Disagree with practically everything I read.)

2. Nowadays when the American people listen to the radio or look at television, they see or hear a great deal of advertising, publicity, and information that attempts to influence their opinions and attitudes. As compared with the average person of your own age, how much are your own ideas likely to be influenced by the things you hear or see on the radio or television?

(Much more influenced than the average person; Somewhat more influenced; Slightly more influenced; About the same; Slightly less influenced; Somewhat less influenced; Much less influenced.)

3. Consider all the magazine articles and newspaper columns presenting a specific point of view which you may have read during the past year. About how many of them may have influenced your opinions?

(Practically none of them; Very few; Some; A fairly large number; Most of them; Practically all of them.)

The answer to each question was given a score ranging from zero, or not influenced, to 5, highly influenced (the extreme categories in question 2 being combined). The S's total score for the entire cluster was obtained by adding together the score values for his answers to the three questions.

The same scoring procedure was used with another cluster dealing with susceptibility to *influence by friends*. The following eight questions were included in this cluster, each of which was accompanied by a self-rating check-list of five categories:

1. How often do you change your opinion if you discover that most other people you know do *not* share your point of view?
2. When one of your friends wants to convince you of his point of view, does he usually have a hard time or an easy time?

3. As compared with the average person of your own age, how much are you usually influenced by the ideas expressed by your friends?
4. As compared with the average person of your age, how strongly do you usually hang on to your own opinions or beliefs at times when your friends are trying to get you to change your mind?
5. How easy is it for your friends to get you to do what they want?
6. When other people criticize your ideas or object to your opinion, how often do you end up feeling that they are right and you are wrong?
7. How often do you become uneasy when the opinions of one of your friends is different from your own on some important topic?
8. How often do you feel sure you know what is right or wrong about the ideas expressed by the people you know?

Table 5 shows correlations between total persuasibility scores (sum of the positive opinion changes shown on the 30 questions in Booklets I and II) and each of the two clusters of self-ratings on susceptibility to influence. These correlations are based on a total sample of 86 males and 96 females who answered all the pertinent questions.

The correlation between the persuasibility test scores and self-ratings on susceptibility to influence by mass communications is significant at the .02 level for males, but the correlation is close to zero for females. The difference between the correlation for males and for females is not significant ( $p = .18$ , determined by Fisher's  $z$ -transformation formula). The fact that the persuasibility test scores of the female subjects bear no relationship to their self-ratings indicates that the two procedures are not measuring the same thing. In the case of the male subjects, however, there is some degree of overlap since the persuasibility test scores enable one to predict better than chance what a subject will say about his responsiveness to mass communications in general. The second relationship studied (persuasibility and susceptibility to influence by friends) shows no strong relationship for either males or females, although the trend is in the expected (positive) direction.

TABLE 5  
*Correlations (Pearsonian r) between Persuasibility Test Scores and Self-ratings on Susceptibility to Social Influence*

Persuasibility test scores correlated with:	Females (N = 96)	Males (N = 86)
1. Self-ratings on responsiveness to persuasive mass communications	.06 ( $p > .25$ )	.26 ( $p = .02$ )
2. Self-ratings on responsiveness to the influence of friends	.11 ( $p > .25$ )	.10 ( $p > .25$ )

NOTE: P values are for two tails.

## DISCUSSION

*Consistency of Individual Differences*

The null hypothesis tested in the present study is that changes in opinion resulting from persuasive communications are wholly topic-bound and are always highly specific to the subject matter of each particular communication. According to this hypothesis, the opinion changes produced by any two communications arguing unrelated cases on unrelated issues would generally be unrelated, and opinion changes following two opposing communications would be negatively related. In the light of the data presented in Table 3 and the factor analysis results in Table 4, the null hypothesis is inadequate. We found a strong relationship between change in opinion on unrelated topics (e.g., between pro civil defense and pro television comedian) and also a strong positive relationship between changes in opinion following opposing communications on the same topic (e.g., between pro civil defense and anti civil defense). The latter type of relationship was found in the case of every one of the five topics, and in four of the five instances the positive correlation is large enough to be regarded as statistically significant. The hypothesis that opinion change is exclusively determined by topic-bound predispositions fails to explain the positive relationships among opinion changes on diverse and opposing communications.

The factor analysis yielded two common persuasibility factors which were positively correlated. This finding suggests that persuasibility may be determined by a general factor combined with one or more group factors that are less limited in scope than the highly specific factors underlying susceptibility to influence on particular topics.

Some further implications concerning the nature of the general persuasibility variable can be gleaned from an examination of the individual differences in opinion changes produced by different communications. It will be recalled that we gave a rationale for predicting that opinion changes in response to the Von Hindenburg and television comedian communications would be the most sensitive indicators of general persuasibility. Our hypothesis was that specific content predispositions are apt to become less important as determinants of change, in comparison with any general persuasibility factor, when the persuasive communications touch upon unfamiliar topics or issues about which the individual has not yet developed any strong (precommunication) interests and motivations. Since Von Hindenburg is virtually an unknown figure to present-day American high-school students, and since the television comedian is in reality fictitious, it was predicted that these two topics would have highest loadings on any general factor of persuasibility. The results of the factor analysis and inspection of the table of tetrachorics largely substantiate this prediction.

In column one of the Centroid Factor Matrix in Table 4 it will be noted that the first communication on the television comedian had the highest loading on the first (unrotated) centroid factor, and the second communication on Von Hindenburg had the next highest loading. The other communications on Von Hindenburg and the comedian also showed high loadings on this factor. Moreover, among the ten communications included in the persuasibility test, the three highest communalities ( $h^2$  in the Centroid Factor Matrix) are those for the two communications on Von Hindenburg and the first communication on the TV comedian. The reliability and internal consistency of the persuasibility test could probably be improved by using more communications on unstructured attitudes of this sort in place of the ones that had the lowest factor loadings.

There is only one communication with a very small loading on the first (unrotated) centroid factor, viz., the first communication on cancer research. This communication is unique in that the opinion changes it elicited turned out to have only a very small, nonsignificant correlation with the opinion changes evoked by each of the other nine communications (cf. Table 3). Individual differences were noted in response to this communication—it was by no means overwhelmingly accepted—but the individual differences were not strongly related to those observed on the other nine communications. Perhaps the explanation lies in the scientific nature of the subject matter. Scientific reports, even when given in popularized form, may be perceived by many laymen as unquestionably authoritative and therefore as noncontroversial. This type of communication might therefore fail to be a persuasive communication comparable to the others in the test; acceptance of this particular communication may be related more closely to other attitude or ideological variables (e.g., attitude toward science). The lack of relationship to the rest of the persuasibility test was not apparent, however, in the second communication on cancer research. The explanation of this may be that the second communication on cancer, taking a diametrically opposite position to the first communication, made the subjects aware for the first time that the issues pertaining to research on a cure for cancer are genuinely in the realm of controversy. In the second booklet, then, this topic may have lost the distinguishing qualities of a scientific communication, and the determinants of individual differences in reaction to this communication may then have become much more similar to those for other controversial topics. In any case, the reliability and the internal consistency of the persuasibility test would be improved if this topic were eliminated.

#### *Relationship of the Persuasibility Test to Self-ratings*

The correlations between self-ratings on susceptibility to influence and the behavioral measures obtained from our persuasibility test give some

pertinent information concerning the equivalence or nonequivalence of the two types of measures. A significant correlation was found between persuasibility test scores and self-ratings on influence by mass communications for the male sample. This finding increases slightly the plausibility of the assumption that both types of measures are tapping a common persuasibility tendency. Nevertheless, one cannot overlook the fact that in Table 5 there is only one significant correlation, which is not a very large one, while the other three are too small to approach statistical significance. From these results it is apparent that the persuasibility test is measuring something quite different from what is measured by the self-ratings on susceptibility to influence.<sup>4</sup> The findings in Table 5 suggest that it will not be an easy task to discover a test of simple self-rating questions to replace the more cumbersome and time-consuming procedure of assessing persuasibility by obtaining a behavioral measure of opinion changes induced by actual exposure to a series of persuasive communications.

If we were to assume that the self-rating scores concerning the influence of friends have some degree of face validity, it would follow that persuasibility, as measured by our behavioral test, is not equivalent to general amenability to social influence. This possibility raises the complex problem of the generality *vs.* specificity of various forms of suggestion and social influence. [Cf. Allport (2)]. It remains for future research to determine whether susceptibility to influence by formal communications of the type presented in our test is predictive of responsiveness to any of the various forms of social pressure or suggestion which occur in direct interpersonal interaction.

#### *Generality of the Findings*

The generality of our present findings is limited by the fact that the experimental communications were delivered to high-school students in a classroom setting. From the outset, we were aware of the possibility that their opinion changes might sometimes represent merely a superficial conformity with a point of view attributed to the school authorities or to a prestigious experimenter. We attempted to minimize this possibility by emphasizing the fact that none of the teachers would see the subjects' answers and by including an explicit statement by the experimenter to the effect that he personally was inclined to agree with some of the communications and not with others. In order to obtain a mental set comparable to

<sup>4</sup> Perhaps the main reason for the low correlations is that the self-rating scores have low reliability. It should be noted, however, that the self-rating score on influence by mass communications, based on only three items, yielded the one significant correlation whereas an approximately zero relationship was found for the self-rating score concerning the influence of friends, which was a more reliable measure, based on eight items.

that occurring in everyday experience with persuasive communications, the subjects were instructed to read the articles as they would articles in a magazine or newspaper. Nevertheless, in spite of all these precautions, generalization beyond the classroom setting may not be justified. It is conceivable that opinion changes occurring in response to the persuasive communications received at home via TV, radio, or other media do not correspond closely to the opinion changes measured by a persuasibility test administered in a classroom setting. Investigations of opinion outside the classroom are needed to determine how far the present findings can be generalized. Obviously, replications with samples of other populations are also needed before one can determine whether or not the persuasibility findings that emerge from our study of high-school students hold true for the entire population of modern urban society.

#### SUMMARY AND CONCLUSIONS

A new behavioral test of persuasibility was devised, which involves measuring the opinion changes evoked when subjects are exposed to a series of ten persuasive communications, varying widely in topic and type of persuasive appeal. The persuasibility test was administered to a sample of 185 high-school students. Changes following the communications were examined to determine whether or not there is any general tendency for opinion changes on unrelated topics to be associated. The persuasibility test scores were also examined in relation to self-ratings on susceptibility to social influence, obtained from a personality inventory.

The results support the following conclusions:

1. The persuasibility test is sufficiently reliable and has sufficient internal consistency to be useful for research on group differences. The corrected split-half reliability was .81. An item analysis showed that all 30 items in the test were positively related to the total score, with 23 of the items being significantly related at or beyond the 10 per cent (two-tail) confidence level.

2. Opinion changes following one persuasive communication tend to be positively related to opinion changes on other communications dealing with unrelated topics. A factor analysis was computed, based on tetrachoric correlations among the subtest scores for the ten communications in the persuasibility test. The results support the hypothesis that there is a general factor in persuasibility; they clearly indicate that the predisposition to change one's opinions is not wholly specific to the topic or subject matter of the persuasive communications to which one is exposed. There appear to be fairly consistent individual differences in persuasibility such that those persons who are most readily influenced by persuasive communications advocating a given set of attitudes or opinions are also most likely to

be influenced in the reverse direction by communications which take an opposing stand on the same issues.

3. For the male subsample, self ratings on susceptibility to influence by mass communications showed a slight but significant relationship to scores on the persuasibility test. The parallel correlation for the female subsample was nonsignificant. In general, self-ratings on susceptibility to social influence do not appear to be measuring the same thing that is measured by the persuasibility scores obtained from our behavioral test of opinion changes following actual exposures to a series of persuasive communications.

*Manuscript received: June 6, 1956.*

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## Influence Measurement in Experimental and Semi-Experimental Groups<sup>1</sup>

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Recent interest in influence processes typified by the work of Hovland, Janis, and Kelley (6), Katz and Lazarsfeld (7), and Schramm (12) has stimulated a rather large number of empirical studies. In turn, the proliferation of research has encouraged preliminary attempts to formulate the outlines of a theory of influence and posed problems associated with the integration of research findings based on divergent operational measures. The empirical relationships among the indices of influence enjoying widest current acceptance have remained largely unspecified, partly at least because of the *a priori* reasonableness of the apparent theoretical connections among them.

In the present study, a standard type of group decision-making situation has been utilized to compare eight different procedures for influence measurement. At the same time, the substantive task area involved and the extent of prior acquaintanceship among group members have been varied to test their effects on the behavior of measurement statistics. The measures used represent different forms of three methods for measuring influence that an earlier review of the literature (10) indicated are widely used: (a) measures based on the attribution of influence by informants, (b) measures based on manifest observed shifts in individual and/or group opinion, (c) measures based on rates of participation or participation profiles in the decision-making activities.

Since different variations of these measures generally have been conceived as measures of the single basic attribute of "influence," a failure to specify the nature of their interrelationships may be exceptionally unfortunate. As Cattell (3) has pointed out, influence research generally has been plagued by a lack of comparability in measures. Moreover, even if the problem of comparability is by-passed by avoiding conceptualization in terms of a single underlying variable, the relationships among influence attribution, opinion change, and decision-making participation warrant investigation in their own right.

In general, we find that common measures of influence do not yield identical results consistently and that in some cases the intercorrelations between rankings of individuals generated by the different measures tend to be quite low. In particular, opinion change measures are substantially

<sup>1</sup> This research was facilitated by a grant made by the Ford Foundation to Carnegie Institute of Technology for the study of organizational theory.

independent of the other two types of measure. Further, we find that the relevancy of the subject matter involved in the discussion affects critically the interchangeability among the measures. Finally, we conclude on the basis of consistent differences between outcomes in experimentally created groups as compared with semi-experimental, ongoing groups that the concept of relevancy in this regard requires further elaboration to include considerations of the relationship between the outcome of the explicit group task and the need for specification of influence relations in the group.

#### RESEARCH DESIGN

##### *Subjects and Procedure*

Fifty subjects, all male college undergraduates without previous experience in group experimentation, were divided into ten five-person groups. On the basis of a sociometric-type questionnaire administered to a pool of potential subjects, the groups were constructed such that half of them were composed of participants who were mutually well acquainted, the other half of participants who were mutual strangers (i.e., at most casual acquaintances). The former groups we treat as semi-experimental since they represent groups of individuals having prior established patterns of interaction.

In all the groups participants were asked to arrive at unanimous group decisions (after having previously recorded individual choices) with respect to the best alternative among a set defined in advance by the experimenter. Each group followed the same procedure, considering questions representing three types of evaluative tasks that were presumed to be related to different influence competences or to reflect different degrees of relevance to groups such as these. First, there was a set of tasks involving the evaluation of the beauty of a number of human females. It was assumed that this represented an area of nonscholastic, collegiate competence with comparatively high relevance for most groups within the college community. Second, there was a set of tasks involving the evaluation of the communicative quality of a number of short paragraphs. Such tasks were assumed to represent an area of scholastic competence of moderate relevance to most college groups and high relevance to some. Third, there was a set of tasks involving the evaluation of the appropriateness of given descriptive titles for a number of original ink blots. These tasks appear to relate to an area without any well-defined competence connotations and of scant relevance to the groups used in the study. The observed group participation rates on the different tasks appear to have confirmed the expectations with respect to relevancy.

The order in which the tasks were considered was systematically varied from group to group.

*Measures*

To provide a test of the relationships among standard influence measures, the individual members of each group were ranked according to eight different measures of "influence." The eight measures represent various forms of the three basic techniques listed above. In order to facilitate the presentation of results, each of the measures has been given a distinctive code number (e.g., A1, C2).

On a preliminary questionnaire, prospective participants were asked to rate the influence of others on the list. A simple index of pre-interaction attributed influence (A1) was obtained by counting the number of respondents who indicated a given individual was either "very influential" or "fairly influential" with other students, and participants within each group were ranked according to this measure.

After the experiment, each participant was asked to rank the members of his group according to their influence (a) over the group as a whole and (b) over him. Combined indices of postinteraction attributed influence over the group (A2) and postinteraction attributed influence over the respondent (A3) were formed by summing the ranks assigned to each of the five members of a group.

Prior to the interaction, each participant ordered five paragraphs according to communicative quality, five girls according to beauty, and five ink-blot titles according to appropriateness. Subsequently, each group arrived at a group ordering in each case. By correlating pre-interaction rankings with group rankings, it was possible to determine the "closeness" of a group decision to the original position of the individual and in that way rank the individuals in a given group with reference to their ability to influence the group decision. By taking the mean rank correlation (the correlation coefficient used was Kendall's tau) over the three tasks, an over-all measure of individual-group similarity of rankings (B1) was obtained.

When the group arrives at a position identical to that which would have been predicted by summing the rankings made by the individual members (i.e., a group mean), the outcome is consistent with an assumption of equal influence among group members. Therefore, Kendall's partial rank correlation between pre-interaction individual rankings of items and groups rankings (holding the group mean constant) was computed. Individuals in each group were ranked according to this index of individual-group similarity of rankings, holding group mean constant (B2).

Estimates were made (pre-interaction individual estimates and group estimates) of the percentile position of a specific paragraph, girl, and title according to the previously specified criteria. The pre-interaction individual judgments were compared with the group decisions. A measure of individ-

ual-group similarity of percentile estimates (B3) was formed by computing the total amount by which the group decisions deviated from original individual positions.

Interactions were recorded and categorized according to the system developed by Bales (1). Two types of interaction measures were defined. Orderings of the members of each group were made on the basis of total participation (C1) and influence attempts (C2). Total participation was defined as the total number of acts initiated by an individual, influence attempts as the total number of acts initiated in the categories "gives suggestion," "gives opinion," and "gives orientation."

#### RESULTS

##### *Intercorrelations among Measures*

In each group participants were ranked according to each of the influence measures defined above. Within groups, a rank correlation coefficient, tau, was computed for each of the 28 pairs of rankings. The mean values of tau for these pairs over the 10 groups are indicated in Table 1. The most obvious feature of the data is the positive but relatively low level of the mean correlations. Half are below .30; only two are above .60. As a somewhat less systematic statistic consider the following: Each of the fifty subjects was ranked either most influential or least influential in his group by at least one measure. Nineteen of the subjects were ranked as both most influential and least influential in their groups by at least one measurement procedure.

TABLE 1  
*Mean Rank Correlations between Pairs of Influence Rankings*

	C2	C1	B3	B2	B1	A3	A2
A1	.22	.20	.26	.01	.08	.37	.16
A2	.59	.58	.10	.40	.31	.76	
A3	.46	.52	.16	.36	.16		
B1	.44	.23	.16	.44			
B2	.40	.31	.06				
B3	.05	.08					
C1	.81						

A1: Pre-interaction attributed influence

A2: Postinteraction attributed influence over group

A3: Postinteraction attributed influence over respondent

B1: Opinion change in group (rankings)

B2: Opinion change in group (rankings, holding group mean constant)

B3: Opinion change in group (percentile estimates)

C1: Total acts initiated

C2: Opinion and orientation acts initiated

TABLE 2  
*Comparison of Correlations between Selected Pairs of Measures*

Higher correlation	Lower correlation	Level of significance (Wilcoxon's Test)
A2-C1	A2-B1	—
A2-C1	A2-B2	—
A2-C1	A2-B3	.05
A2-C1	B1-C1	.05
A2-C1	B2-C1	.05
A2-C1	B3-C1	.01
A2-C2	A2-B1	—
A2-C2	A2-B2	.05
A2-C2	A2-B3	.05
A2-C2	B1-C2	—
A2-C2	B2-C2	.10
A2-C2	B3-C2	.01

In general, the measures used here do not represent universally interchangeable indices of an underlying variable. In the present experiment, the only consistent exceptions to this rule were the correlations between the two forms of postinteraction attributed influence (A2 and A3) and between the two measures of interaction participation (C1 and C2).

The measure of postinteraction attributed influence over the group (A2) and interaction measures were more highly correlated with each other than either was with opinion change measures. Table 2 shows the significance level attained by the differences, using Wilcoxon's signed rank test for differences between matched pairs of observations. A similar, though slightly less pronounced, relationship holds if the measure of postinteraction attributed influence over respondent (A3) is used.

#### *Variations by Task*

With respect to the task areas, rankings according to opinion change measures were consistently better correlated with attributed influence measures where the presumed high relevance tasks of judging female beauty were involved than it was in the other tasks. Table 3 shows the ordering of correlations between preinteraction attributed influence and a combined opinion change measure formed by combining results obtained by measures B2 and B3, by type of task and by group. Although no similar dependence on task area was observed in correlations between opinion change measures and interaction measures or between attributed influence measures and interaction measures, a related phenomenon with respect to the interaction profile of leaders in the acquaintance groups was found and is discussed below.

TABLE 3

*Observed Ordering of Correlations between Pre-interaction Attributed Influence and Opinion Change, by Type of Task*

Group	Type of task		
	Beauty	Essay	Ink blot
A	1	3	2
B	1	2	3
C	1	2	3
D	1	2.5	2.5
E	2	1	3
F	1	3	2
G	1	2	3
H	3	1	2
I	1	3	2
J	1	3	2

NOTE: p is less than .05 (Kendall's test for concordance).

#### *Variations by Type of Group*

When the performances of measures in the two types of groups are compared, it is clear that opinion change measures tended to be less well correlated with other measures in groups of acquaintances than in groups of strangers once the initial stages of interaction were completed. In the case of the correlation between the combined opinion change measure and influence attempts, there was improvement over time in the correlation in groups of strangers but no comparable result in the acquaintance groups. As is indicated in Table 4, the differences between the two types of groups in the last third of the interaction were quite substantial. A similar tendency was observed with respect to the correlation between opinion change measures and postinteraction attributed influence measures, but the differences did not quite reach the .05 level.

TABLE 4

*Correlation between Opinion Change and Influence Attempts Measures, by Type of Group and Part of Interaction*

Part of interaction	Groups									
	Acquaintance					Stranger				
1st $\frac{1}{3}$	.32	.20	.11	.40	.00	-.28	.00	-.76	.32	-.20
3rd $\frac{1}{3}$	.11	.33	.11	-.77	.00	.53	.83	.32	.36	.32

NOTE: The differences by type of group are significant at the .05 level (U-test) with respect to both the improvement over time and the results in the last third of the interaction.

TABLE 5

*Correlation between Pre-interaction Attributed Influence and Influence Attempts, by Type of Group*

Type of group	A1-C2 correlations				
Acquaintance	.53	.53	.60	.12	.11
Stranger	.11	.11	.00	.00	.11

NOTE: The differences by type of group are significant at the .05 level (U-test).

In addition, as indicated in Table 5, pre-interaction attributed influence was more highly correlated with influence attempts in groups of acquaintances than in groups of strangers, but no such relationship held between pre-interaction attributed influence and opinion change.

#### *Interaction between Task and Type of Group*

In each group we consider the individual who was ranked highest according to the attributed influence over respondent measure (A3) and observe his participation profile in group discussions as the magnitude of total group participation varies. Specifically, it was predicted for reasons indicated below that in groups of acquaintances (but not in groups of strangers) the proportion of total influence attempts initiated by the highest ranking individual would be lowest in the task area to which the group as a whole devoted the least time, and the proportion of total supportive acts (i.e., "shows solidarity," "shows tension release," "agrees") initiated by the highest ranking individual would be lowest in the task area to which the group as a whole devoted the most time. On the null hypothesis that the participation profile of high ranking individuals is independent of total group participation, each prediction should ordinarily be confirmed in only one third of the groups, since there are three task areas involved. Among groups of acquaintances, each prediction was actually confirmed in four out of five groups, a result that is significant at the .05 level by standard Bernoulli tests. (The test of concordance and direction also yields a result significant at the .05 level.)

Neither of these regularities is observed in the groups of strangers.

#### DISCUSSION

The rather low intercorrelations found among variants of commonly used indices of interpersonal influence suggest the importance of caution in comparative interpretation of research results based on different measures. At the same time, the variations from one task to another and from one type of group to another suggest that at least some differences can be explained in terms of such variables.

Before proceeding to a discussion of the task and group variables, however, it may be well to specify an additional factor presumably relevant to the question of measure intercorrelation. Suppose that in fact the relationship between two influence measures is one-to-one with moderate error over the whole range of possible values and the true correlation between the measures (over the whole range) is high. Then suppose that we so choose our subjects as to restrict the range of possible values considerably. Under such conditions, the error will become larger relative to the range of values and the observed correlation will be smaller. Thus, the correlation among influence measures in all probability depends on the range of values present in the sample studied. In the present experiment, the differences in influence can be presumed to be small relative to the range likely to be found either in groups having formally defined authority relations such as those studied by Torrance (15) or in groups involving individuals of varied general social status, and a part of the low correlations is properly attributable to that factor. Where grosser differences are involved the correlations may well be higher.

Regardless of the correlations over a wider range, at least some of the variability in the range represented in this study appears to be nonrandom and tentatively explicable. A striking characteristic of the correlations is the tendency for opinion change in the groups to be relatively independent of both attributed influence and interaction participation. A partial explanation for this phenomenon in these groups appears to be the strong tendency for group decisions to approximate the mean of the individual pre-interaction positions. Thus, one major reason for the rather low correlations between opinion change measures B1 and B3 and other measures may be the fact that greatest influence is ordinarily assigned to the individual who happens to have made an original estimate near the mean of the estimates made by his coparticipants, and ability to thus "guess the mean" does not appear to be either consistent from one item to the next or particularly well related to other measured characteristics. That this is not a complete explanation is indicated, however, by the fact that even when an attempt is made to control the effect of the tendency to the mean (in the B2 measure), the improvement in correlations with other measures is small (Table 1).

One obvious interpretation of the result lies in the presumed insensitivity of both interaction measures and the perception of subjects to the nuances of influence pressure. To a certain extent, the question "Who is most influential in the group?" is probably treated as identical with "Who talked most in the group?" since participation is an easily available datum. Moreover, it might be argued that in the long run the self-Confirming features of such rules of inference serve to eliminate gross errors and reduce

the independence of opinion change. Although such an interpretation probably has some merit, we cannot accept it entirely for two reasons. First, the independence of opinion change varies significantly from task to task (Table 3) and from one type of group to another (Table 4). Second, we find opinion change to be *more* random rather than less in ongoing groups such as the acquaintance groups in the present study.

The key to understanding the relationship between opinion change measures and other measures appears to lie in the concept of relevancy. By the relevancy of an activity to a group is meant the extent to which it is associated with the shared basic values of group members or is important to the functioning of the group as an identifiable entity. Schachter (11) has found that the more relevant the task involved, the stronger the pressure to communicate and to exert influence. Relevancy, however, has more than one component. In the first place, group members may conceive one task area as intrinsically of greater importance than another. Thus, we find that participation is generally greater on tasks dealing with female beauty than on other tasks and that opinion change is more closely related to attributed influence on such tasks of presumed higher relevancy than it is on other tasks. The reduction in influence pressure associated with a lack of task relevancy tends to blur the influence structure within the group. Some suggestions as to why this is true are offered below.

More significant from the point of view of the present data, the relevancy of the task problem, *per se*, is not the only kind of relevancy which affects group behavior. As Kelley and Thibaut (8), Guetzkow and Simon (5), and others have pointed out, a task-oriented group has both an explicit task and an organizational task to perform. It is convenient to think of groups such as those studied here as responding to such needs. There is pressure not only to arrive at a decision on the specific problem specified by the experimenter but also to define or maintain a structure of interpersonal relations in the group. In experimentally created groups such as the groups of mutual strangers, the definitional problem is particularly acute since there are few shared expectations with respect to influence relationships. In the semi-experimental acquaintance groups, on the other hand, we would expect the organizational problem to be that of maintaining a generally accepted structure rather than creating one. That an influence structure exists more clearly in the groups of acquaintances than in the other groups is indicated by the fact that pre-interaction attributed influence is a significantly better predictor of influence attempts in such groups than it is in the purely experimental groups (Table 5).

The data suggest that the functions performed by remarks made in a task-oriented group depend on the extent to which it has an existence independent of the experiment, and in particular that control by perceived

leaders over the results of the manifest decision task is of less importance to the maintenance of relationships in ongoing groups than it is to the formation of relationships in newly created groups. Thus, the fact that opinion change is more closely related to interaction in groups of strangers can be attributed to the fact that all the tasks involved here have organizational relevance to such groups. In the semi-experimental groups, individuals with high attributed influence tend to withdraw more than proportionately from the task problem as total group participation (and thus presumably task relevancy) decreases, thereby reducing the apparent clarity of relations. This is feasible because the underlying structure is substantially acknowledged. In the other groups, which can be treated as emerging groups, there is no well-defined structure and a comparable dependence of participation profile of high-ranking members on total group participation is not found.

Granted the feasibility of such behavior, it is not hard to specify reasons why acknowledged leaders of ongoing groups would withdraw from explicit dominance given the general cultural norms within which the groups can be presumed to operate and the manifest unimportance of the decisions being made. Under egalitarian social norms, overt signs of influence inequality will result in tensions within the group and pressure to withdraw on the part of the low-ranking members (4, 9). Participative decision-making is a partial response to this problem within an hierarchical organization. However, disparities of power specified by formal hierarchies are not the only disparities perceived by individuals, and group discussions under formal rules of equality are not necessarily a complete solution to the problem of maintaining the group. Consciously or unconsciously, the leaders of the ongoing groups studied here appear to have adjusted to this complication by recognizing circumstances under which their task leadership will be significantly reduced and their participation in a supportive role increased. This suggests that the role-specialization in small groups found by Bales (2), Slater (13), and Strodtbeck (14) should not be conceived as a fixed specification of participation profiles but as a norm around which some variance is found as the task facing the group varies. In our semi-experimental groups, the individual profiles shifted as the groups shifted task focus. This is quite consistent with Bales' general hypothesis that influence attempts require equilibration within the group through supportive acts. It does seem to indicate, however, that in ongoing groups the equilibrating process occurs not only through interpersonal role specialization but also through individual intertask variation from the dominant personal role.

In the groups of strangers, on the other hand, these long run maintenance needs are less important than the definition of roles within the group, and the distinction between different tasks tends to disappear. The function of

the discussion appears to be primarily that of influence role definition. It would appear that these groups cannot approach the job of blunting the impact of influence inequalities until the precise nature of those inequalities is established. Consequently, the explicit decision, which is typically of comparatively little importance among the ongoing groups, is of greater importance to the emerging groups.

These interdependencies between type of task posed to the groups and the extent to which it has an acknowledged influence structure on the one hand, and the function of opinion change and interaction participation on the other, result in substantial variability in the intercorrelations among standard influence measures as they are applied to different types of tasks and groups. As a result, the integration of studies of influence requires suitable allowance for such factors. In particular, the much overused, doubtless correct, but not very helpful stricture against generalizing indiscriminately to long-term, multifunctional groups from results obtained through *ad hoc* measures on short-term experimental groups dealing with a single type of problem can be made somewhat more specific.

At the same time, since all the tasks involved in the present experiment required choice among a fixed set of alternatives and were in task areas having only ill-defined criteria of choice, generalization of the results obtained here to situations in which search for additional alternatives is allowed or in which commonly accepted objective criteria for evaluation are available can be made only with appropriate caution.

*Manuscript received: March 26, 1956*

*Revised manuscript received: June 4, 1956*

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## **Self Perceptions and Descriptions of Opposite Sex Sociometric Choices**

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In recent years several studies have been concerned with an aspect of the perception of other people called assumed similarity or assimilative projection. Fiedler (5) has described the history, ways of measuring, and theoretical implications of the concept. In assumed similarity studies the interest is in the degree of similarity of A's perception of B to A's perception of himself, as distinguished from empathy or accuracy of perception studies which measure the similarity of A's perception of B to B's perception of himself.

Although most of the findings from this growing body of research (1, 2, 3, 4, 6, 7, 9, 10, 11, 13) are based upon the same sex pairs of individuals, there have been studies in which the perceived and the perceiver were not members of the same sex. Notcutt and Silva (12) had married subjects rate themselves and their spouses on a questionnaire and concluded from an analysis of the ratings that, "we judge others by analogy with ourselves, and the less valid the analogy, the less accurate is the judgment." Sopchak (14), in a study of parental identification using the MMPI, found that men tend to identify (assuming similarity) with their fathers more than their mothers and women to identify more with their mothers. These findings, dealing with specific kinds of opposite sex perceptions, viz., spouses and parents, lead us to consider assumed similarity in another area of opposite sex perception: opposite sex peers.

Of first concern is whether or not the hypotheses regarding assumed similarity which have been demonstrated using the same sex peer perceptions can also be demonstrated using opposite-sex perceptions. Two hypotheses have been selected and serve as the experimental hypotheses for the present study. The first of these is that individuals tend to perceive themselves as more like their positive sociometric choices, in a peer group, than like their negative sociometric choices. This was demonstrated first by Fiedler, *et al.* (6) and later by Lundy, *et al.* (9).

The second hypothesis, also from the study by Lundy, *et al.*, (9) is that people tend to describe their positive sociometric (opposite sex) choices as more similar to acceptable self descriptions than to unacceptable self descriptions, while negative sociometric (opposite sex) choices are described as more similar to their unacceptable self descriptions than to their acceptable self descriptions. These two hypotheses were selected because they are significant from a theoretical point of view, and because they may be

first steps in understanding the interpersonal perceptions of opposite sex pairs.

G. A. Kelly (8) has recently presented a personality theory in which an individual's concepts (perceptions) of himself and of other people serve as the basic elements of the theory. According to Kelly, the most fruitful way of attempting to understand a person may be to consider the ways in which *that person* tries to understand (conceptualize) the people about him. One way of conceptualizing another person is in terms of his similarity to the conceptualizer, thus, the assumed similarity. An explanation of the hypotheses of assumed similarity to the area of opposite sex perceptions will, therefore, tend to broaden and perhaps modify the theory from which some of these hypotheses were derived.

The second reason for the selection of these two hypotheses for study is because they may cast some light on the general area of opposite sex perceptions. Developmental psychologists have been concerned with the adolescent in terms of general characteristics of a preferred or rejected opposite sex person. These have frequently been analyses of the "ideal date" or preferred masculine or feminine traits, and some fairly definite norms for age groups have been established.

We need to know more than the general characteristics of preferred or rejected opposite sex peers, however. The reasons why a particular individual makes his choice can be understood only when we begin to consider the manner in which *that individual* thinks about opposite sex peers. We would suggest that a starting point in investigating these individual approaches to people is to consider the relationship between the individual's notions about himself and his notions about opposite sex peers; specifically for this study, the ways in which these two notions are alike.

#### PROCEDURE

##### *Subjects*

The Ss were 43 students in the beginning course in psychology who volunteered to complete a personality questionnaire.

##### *Personality Description Blank*

A multiple choice personality description blank used by Lundy, *et al.*, (9) served as the measuring instrument in the present experiment. The blank consisted of 80 statements, considered appropriate for college students, selected from the MMPI. These statements were randomly placed in groupings of four, yielding 20 multiple-choice items. Each S completed the list of items four times: for self, for ideal self, for opposite sex positive sociometric choice, and for opposite sex negative sociometric choice. The sets of instructions, systematically varied to control for possible sequence

effects, were as follows: Select one statement out of each group of four (a) which most nearly applies to you (Self), (b) which would characterize you as you would most like to be (Ideal), (c) which would best characterize the student here at school with whom you would most like to spend your time. Select a person of *the opposite sex* whom you know fairly well. Do not include husbands or wives, (d) which would best characterize the student here at school with whom you would *least like* to spend your time. Select a person of the *opposite sex* whom you know fairly well. Do not include husbands or wives.

#### *Data Analysis*

The total number of times a self-description item was the same as the positive sociometric choice but different from the negative sociometric choice constituted the positive choice score. The negative choice score indicates the number of items in which the self-description was the same as the negative sociometric choice but different from the positive choice.

The acceptable and unacceptable aspects of each S's self-description were found by noting the items on which the self-description and the ideal self-description were the same and those on which they were different. Thus, self-acceptability was operationally defined by agreements between the self and ideal self-descriptions, and self-unacceptability defined by disagreements between the self and ideal self-descriptions. This procedure yielded two scores for each S: a self-acceptability score representing the number of items on which the self and ideal self were the same, and a self unacceptability score representing the number of items on which the self and the ideal self-descriptions differed. Either of these two scores for each S could vary from 0 to 20, and together totaled 20.

The number of items on which acceptable self-descriptions were the same as S's descriptions of the positive sociometric choice but not the same as the negative sociometric choice made up the acceptable-positive score.

The number of items on which the acceptable self-descriptions were the same as S's descriptions of the negative sociometric choice but not the same as the positive sociometric choice made up the acceptable-negative score. Similarly, the unacceptable-positive and unacceptable-negative score were ascertained.

Because the number of acceptable self-description items was generally greater than the number of unacceptable ones, the acceptable positive score was divided by the total number of acceptable items and the unacceptable-positive score was divided by the total number of unacceptable items before the comparison between the two was made. The same procedure was carried out for the acceptable-negative and the unacceptable-negative scores.

TABLE 1  
*Comparison of Means*

Self-descriptions Same as Positive Sociometric Choice and Self-descriptions Same as Negative Sociometric Choice

	Means	Diff. means
Positive choice	8.535	
Negative choice	1.721	6.814*

\* Significant beyond the .01 level for a one-tail *t* test.

TABLE 2  
*Comparison of Means*

Acceptable Self-descriptions Same as Positive or Negative Sociometric Choice and Unacceptable Self-descriptions Same as Negative or Positive Sociometric Choice

	Means	Diff. means
Acceptable-positive	59.651	
Unacceptable-positive	22.465	37.186*
Unacceptable-negative	11.791	
Acceptable-negative	3.767	8.024*

\* Significant beyond the .01 level for a one-tail *t* test.

#### RESULTS

The first hypothesis is that self-descriptions are more like descriptions of opposite sex positive sociometric choice than like descriptions of opposite sex negative sociometric choice. Table 1 gives the means of the "positive" items and the "negative" items, and the difference between means is significant; the first hypothesis is supported by the data.

The second hypothesis is concerned with descriptions of sociometric choices as they are similar to the acceptable or unacceptable aspects of self-descriptions. In Table 2 the means of the acceptable-positive and of the unacceptable-positive scores are compared, as well as the means of the unacceptable-negative and of the acceptable-negative scores. The hypothesis is supported; for we find acceptable-positive significantly greater than unacceptable-positive and unacceptable-negative significantly greater than acceptable-negative.

#### DISCUSSION

The comparison in Table 1 presents a significant difference between the degree of perceived similarity of an S's perception of himself to his percep-

tion of his opposite sex positive sociometric choice and the degree of perceived similarity of S's perception of himself to his perception of his opposite sex negative sociometric choice. Presumably, the difference in perceived similarity may be just as sharp between a person's perceptions of members of the opposite sex as it is between his perceptions of members of the same sex. This means that people may be able to discriminate highly among members of the opposite sex in terms of the perceived similarity to oneself. Those people who are liked, who are one's best friends, are perceived as more similar to oneself than those who are disliked, even when those liked and disliked people are of the opposite sex.

In the second set of comparisons the hypothesis that the opposite sex positive choice is more similar to the acceptable aspects of self-perception than it is to the unacceptable aspects is supported. Also, opposite sex negative choice is found to be more similar to the unacceptable aspects of self-perception than to the acceptable aspects. A person, therefore, perceives opposite sex liked people in terms of his own acceptable attributes; but perceives opposite sex disliked people in terms of his unacceptable attributes. Stated in assimilative projection terms, a person projects his acceptable traits onto those he likes, be they same or opposite sex, and projects his unacceptable traits onto those he dislikes.

Two problems should be mentioned in relationship to the statements above. The first concerns the "projection" hypotheses, as stated. One can wonder whether a person likes or dislikes another as a result of finding him similar or dissimilar to himself, or, as implied by the assimilative projection hypothesis, one likes or dislikes a person and then projects his own attributes. One must also wonder about the degree to which "real" similarity or dissimilarity affects the likes and dislikes among opposite sex peers. This problem is an important one, but it may not be the first nor the most crucial to solve. Thinking in terms of Kelly's theory again, we can see that understanding a person's concepts of another person may be aided by comparing those concepts with someone else's ideas about the second person (the second person's, a group's, or some "objective" observer's). At the same time this does not give us complete understanding of his interpersonal relations. We may be able to know more about the first person by comparing those concepts he has about another person with other concepts he has about his world in general, about people in general, about his mother or father, or, as in the present study, about himself.

The second problem, much more amenable to research methodology, is the one we might call complementarity. Are there not some aspects of the opposite sex, which are a part of the reasons for liking a person, which are not acceptable aspects of oneself? Do not feminine, or passive, women like masculine, or aggressive, men, and vice versa? We usually assume this to be true, yet there are no perceptual studies bearing on the problem. In the pres-

ent study, the items for the questionnaire were selected originally so as not to discriminate between the sexes. Therefore we cannot look for suggested answers in the current data. The present study, rather, attempts to answer the question: can hypotheses derived from studies of same sex perceptions also be supported in studies of opposite sex perceptions, using the same tools and methodology? The data suggested an affirmative answer.

*Manuscript received: December 1, 1955*

*Revised manuscript received: June 21, 1956*

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THE AMERICAN SOCIOLOGICAL SOCIETY

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*Sociometry was founded in 1937 by J. L. Moreno*

Communications for the Editors and all manuscripts should be addressed to Leonard S. Cottrell, Jr., Russell Sage Foundation, 505 Park Avenue, New York 22, New York. Business communications should be addressed to Matilda White Riley, The American Sociological Society, New York University, Washington Square, New York 3, New York.

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